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# THE ARCHITECTURAL FORUM

FOR QUARTER CENTURY THE BRICKBUILDER

## HOSPITAL NUMBER

### COUNTY TUBERCULOSIS HOSPITALS

By Wm. H. Scopes and Maurice Feustmann

### PLANNING FOR FUTURE EXPANSION

By Richard E. Schmidt

### MECHANICAL EQUIPMENT OF HOSPITALS

By D. D. Kimball

### SOME RECENT HOSPITALS

From the Work of

Haven & Hoyt

Charles R. Greco

Lord & Hewlett

Scopes & Feustmann

Harold Field Kellogg

Ludlow & Peabody

Davis, McGrath & Kiessling

Richard E. Schmidt, Garden & Martin

JUNE 1919



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# THE EDITORS FORUM

**W**E have devoted the major portion of this issue to hospital buildings with the thought of bringing to the attention of the profession the latest examples at a time when plans for the erection of new hospitals are being discussed in a great many localities. Attention is given in this one number to both general and tuberculosis hospitals; the latter are being thought of by the medical profession in an entirely different way than was the case a few years ago. They demand of the architect today fully as much research and ingenuity in planning as the general hospital. The danger to the public that exists through the ease with which tuberculosis is spread is very fast developing a public policy of adopting vigorous measures for its suppression. Most States maintain sanatoriums for treatment of sufferers, and a number of States have recently passed legislation requiring their cities exceeding a certain population to provide hospital facilities, and in New York, Massachusetts, Texas and some other States, county institutions to care for cases beyond the incipient stage have been required by law.

In the field of general hospitals, it is probably conservative to place the number of buildings at one thousand that have been delayed in construction through the difficulties imposed by war. With opportunities for securing hospital funds better now than for a number of years past, an important resumption of hospital building may soon be expected.

**T**HE requirements for the successful practice of architecture are constantly growing more numerous and complex in keeping with the general tendencies of the modern business world. Today the architect must be in a position to advise his client on a great many subjects of a purely business nature, with which he was formerly little concerned. Inasmuch as a single item — the rate of insurance on a proposed building, the percentage of the total cost a loan may represent, or a fear of depreciating land value, may of itself be sufficient to deter an owner from going ahead with a building, it is for the architect's own best interest to have definite knowledge of these contributing factors so that he may view the problem from all angles.

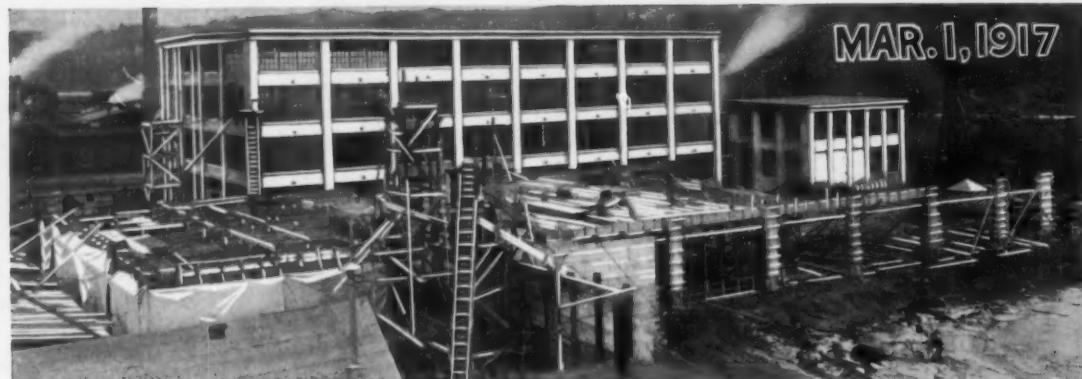
The need for such information has prompted us to establish a Department of Architectural and Building Economics as a regular feature of **THE FORUM**, edited to consider the third function of the profession — business relations. Its initial appearance is in this issue and it is hoped that the data it will present with reference to financing and other business factors will provide the type of information architects have lately shown a wide interest in.

## BOOK NOTE

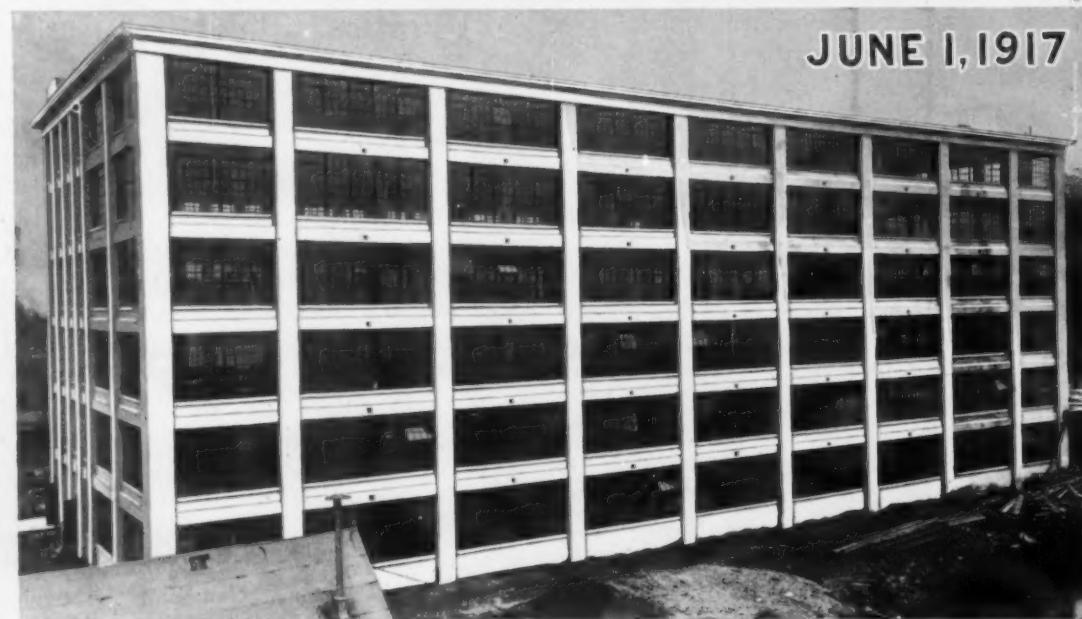
**THE AMERICAN HOSPITAL OF THE TWENTIETH CENTURY.** By Edward F. Stevens, Architect. 275 pages, 7 x 10 inches. Illustrated. New York. Architectural Record Publishing Company. Price \$5.00 net. The works available on modern hospital design and construction are few in number and a book prepared by an architect, who for a number of years has devoted himself exclusively to the design of medical institutions, will be received as a valuable source of information. Mr. Stevens begins his consideration of the subject at the start of the present century, for in the brief space of time since elapsed probably the greatest strides in hospital design and equipment have taken place. Advance in medicine and surgery is so rapid that there is little advantage to be had in the study of earlier hospitals. The book is composed of short chapters on the various elements of hospital building. The subject matter is presented from the architect's viewpoint — evolving the plan to accord with requirements laid down by the medical practitioners without detailed reference to the reasons shaping those requirements.

A particularly valuable feature of the book is the large number of plans that are reproduced at good size. These are introduced through the various chapters to illustrate points of the text, and with the descriptive notes of each, a mass of detailed information is given in a limited space. Special chapters are devoted to the subjects of heating, ventilating, plumbing, hospital finish and equipment, in the preparation of which the author had the advice of specialized experts. They are well illustrated with diagrams of good size and photographs of installations.

Judging from the buildings illustrated, which are representative of American work, the modern hospital rates very high from the standpoint of plan. There has been a satisfactory spirit of coöperation between the medical and architectural professions that has been a great aid in bringing about this development. Considering the average hospital from the architectural viewpoint, however, it cannot be said that a correspondingly high standard has been reached. The expense of equipment, mechanical appliances and the large amount of building required per patient have probably made it difficult to expend money for anything but a severely utilitarian structure. It is to be hoped that architects can overcome this handicap and through exercise of ingenuity in the use of materials and color give to the façade of the modern hospital the cheerful, decorative character that in healing the sick has definite virtue, and dispel from the public mind the last trace of prejudice that makes the hospital appear cold and institutional.



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NUMBER 6

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VIEW IN WALL STREET  
TOWARD TRINITY CHURCH, NEW YORK CITY  
From Photograph by John Wallace Gillies

*The Architectural Forum Series of distinctive architectural street compositions of New York City. The majestic facade of the Subtreasury is seen at the right, and beyond, the lower stories of the Bankers' Trust Building.*

# THE ARCHITECTURAL FORUM FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXX

JUNE 1919

NUMBER 6

## The County Tuberculosis Hospital

A DISCUSSION BY WILLIAM H. SCOPES, A. I. A., AND MAURICE M. FEUSTMANN, A. I. A.

AN examination of the planning of a large number of sanatoriums for the tuberculous, particularly county institutions, erected throughout the country during the last ten or twelve years, shows that in many instances a large percentage of the patients is housed in shacks or open wards, reserving relatively little infirmary accommodations for severe cases. So widespread has the use of the shack type of pavilion become as to justify the assumption that many designers and projectors of sanatoriums consider this the accepted type of housing for all but the most advanced cases. The originator of the shack, the late Dr. Herbert M. King, never intended such an indiscriminate use of the product of his ingenuity. He evolved this type of housing to provide inexpensive accommodations for needy patients of the incipient, ambulant or hardy type; in other words those who were up and about, able to do for themselves and able to stay out of doors, day and night, in all kinds of weather. Restricted to this class of patient (not necessarily needy, however,) the open ward type has served and is still capable of serving a most useful purpose, particularly where funds are limited. It might be remarked, however, that some sanatorium physicians do not look with favor upon the shack even for incipient cases in climates where long and severe winters prevail. But in any event the open ward pavilion is not suited to the moderately advanced case and, of course, it is out of the question entirely for the far advanced case. The above statement is made with the reservation that sometimes a moderately advanced case will make such progress toward recovery that shack housing is practicable.

Some fifteen or more years ago a leader in the movement to fight tuberculosis predicted that today there would be no more tuberculosis. This influenced much construction and many workers, perhaps at times unconsciously, and may be responsible for a great deal of the almost temporary construction of the past few years. Today tuberculosis has not disappeared from the face of the earth and there should be no relaxation in the effort to provide suitable hospital accommodations for its treatment. Tuberculosis hospital design and construction should be taken as seriously and the structures provided should be made equally as permanent as buildings for general hospitals.

Just here it might be well to restate the hospital or sanatorium requirements for types of tuberculous patients mentioned above. Due to the fact that the public has been thoroughly instructed as to the importance of open air in the treatment of tuberculosis, the notion has taken rather firm hold that, after the average patient has been provided with a place on a porch and a washroom, the principal wants have been taken care of. The situation, however, is not so simple, for the patient has other experiences than to repose quietly out of doors the better part of twenty-four hours. Some of the manifestations to be combated and provided for are fever, chills, night sweats, paroxysms of coughing, hemorrhages (or at least discoloration of the sputum,) pleuritic pains and a host of others. Some of these manifestations render the patient absolutely helpless; at such times, and the latter are by no means seldom, the tuberculous patient requires all the comforts of the small general hospital ward or private room with practically all of the usual hospital accessories and in addition to this, ample porch room to which the patient must have the freest access even when moribund, because the latter state in tuberculosis often lasts for weeks—and open air is not to be denied even the dying patient if it be desired.

The impracticability of caring for a patient with any of the above manifestations in an open shack or lean-to must be apparent even to a layman. Consideration should be given the fact that many sanatorium physicians and chest specialists insist on bed rest for the first month of treatment even in early cases.

It should be understood that the condition of the patient described above applies not to the fewest cases which the county hospital may be called upon to treat, but to the majority of cases, in some instances as high as eighty per cent of the admitted patients. If this statement comes as a surprise to many, let them be assured that even in some private sanatoriums, receiving no public funds whatever and therefore free to pursue a fixed policy of accepting only the most favorable cases, it is difficult to hold down the proportion of moderately advanced patients to less than thirty-five to forty per cent. When the average patient afflicted with tuberculosis is willing to become a county charge, his disease is usually much farther advanced than the incipient stage.

Hence it will be seen that the housing of the average tuberculous patient is not best accomplished by an indiscriminate use of the open-air ward or shack, especially when the requirements of the county sanatorium are under consideration. This statement requires no better proof than to point to the well established fact that there is at this moment an urgent demand throughout the country for more infirmary accommodations to take care of tuberculous patients.

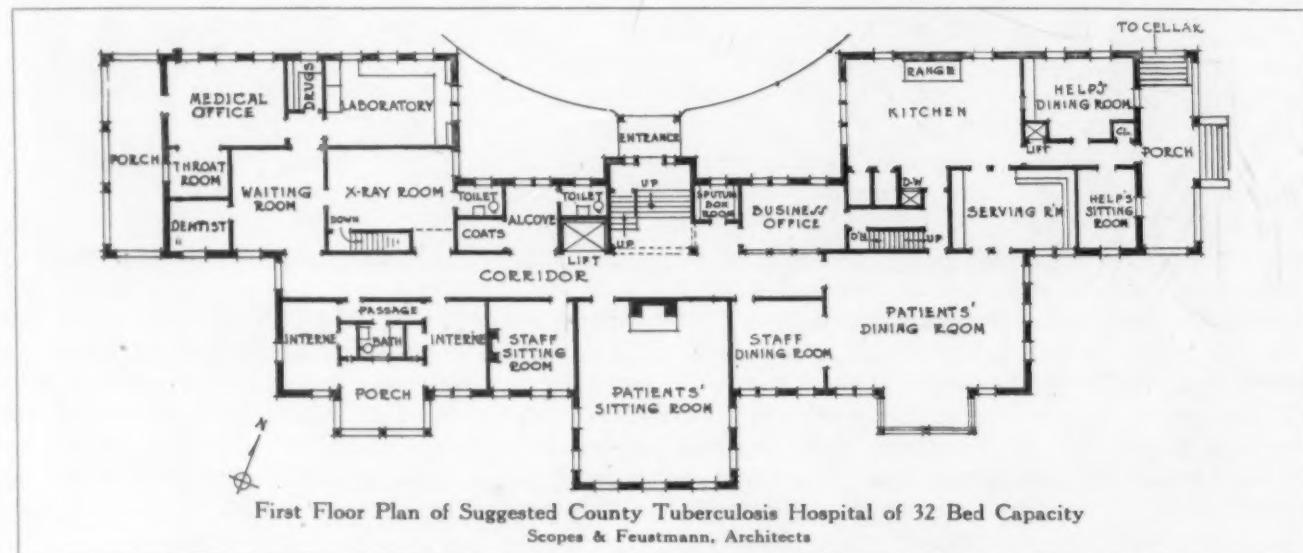
It is, therefore, rather surprising that county officials are not only permitted, but encouraged to place before the electorate propositions to erect sanatoriums in which the accommodations for the moderately advanced and the advanced cases are not greater than in many institutions receiving only the most favorable cases, whereas the county must or should admit all cases.

It is for the purpose of contributing something towards a movement which will act as a corrective to this tendency, that the authors of this article desire to submit suggestions for the planning of a building for a small county sanatorium which shall be arranged and equipped to take care of all classes of patients as reported by the visiting nurse, poor master or other official. The scheme is not put forth in a dogmatic manner; it is not intended to be followed as the standard type of county sanatorium, because it is recognized that each county will have its own special needs to consider, but as it contains a number of features which have been found workable in other institutions, it may prove of use to those contemplating the planning of new hospitals. The floor plans are those of a main building which shall be the nucleus of a group forming the county sanatorium, starting with thirty-two beds, the final capacity being about fifty adults, the initial beds being distributed in rooms holding one, two, three, or seven patients, thus enabling the institution from the start to care for early, moderately advanced and far advanced cases with considerable ease and flexibility. In other words, all wards

and single rooms may be used either for infirmary or early cases because any housing suitable for advanced cases can be used for early cases and this is not true of the reverse. As all the rooms, etc., are designated on the plans, only the salient features need be described. The building, facing slightly east of south, is supposed to be located on a site which slopes gently from north to south. Only limited use of the basement is contemplated; it is intended principally for storage purposes as it is not consistent in a tuberculosis sanatorium to ask employees to spend much time in a basement where the finished floor line is below grade level. The handicap of lack of ground space does not apply in the case of a sanatorium or hospital built in a country or suburban district. The heating plant may be located in the basement, although a better plan would be to construct a small building to contain the heating apparatus, laundry, power plant (possibly) and rooms for the male employees.

Referring to the first floor plan, it will be noted that the principal entrance is at the rear, thus shielding the patients from the noise and dust of vehicles. The domestic administration is kept as far as possible from the medical administration. At the main entrance is placed a bureau of information and business office close enough, at the same time, to the kitchen and accessories to control activities in that part of the house. The dining room is supposed to accommodate all the patients likely to go to their meals when the institution has reached its capacity. Near the entrance to the dining room is placed a room for sputum cups; if this is not provided, then ambulant patients going to their meals are likely to deposit their sputum cups anywhere in the main corridor.

The interne's suite, consisting of bedroom, bath, study and sleeping porch, is at the southwest corner near the medical department. The latter has been planned on a liberal enough scale to provide the medical wants of the hospital when it will have reached its maximum growth. So important has the



X-ray become as an aid in the diagnosis of tuberculosis that it has been thought well to place it conveniently on the main floor very close to the medical office. A small staircase leads from the X-ray operating room to the dark room and to the laboratory storerooms and plate storage rooms in the basement.

The laboratory is considerably larger than would be required for routine examinations; this has been done intentionally, for while the county sanatorium should not undertake research work, yet if a laboratory of comfortable dimensions is provided, containing adequate equipment, it will undoubtedly act as a stimulus to the physician in charge and to the assistants he will require as the institution grows; in this way the county will be able to attract to its medical staff men of greater experience and ability than if no such inducement were offered. Furthermore, this laboratory can, and indeed should, be used to make all the bacteriological and chemical tests which the county will require in the treatment of its indigent sick; such tests need not be confined to tuberculosis.

The throat room is intended, not only for the purpose of laryngal and pharyngal treatment, but for administering gas in artificial pneumo-thorax. For obvious reasons a dental room is considered not only desirable, but essential.

Patients are housed on the second and third floors. The latter is not illustrated, but is the same as the second story, except that the nurses and women office employees are quartered in the east wing over the maids' rooms; a linen storeroom and mending room will also be located here.

As stated above, there will be thirty-two beds, sixteen to a floor, one sex to each floor. The distri-

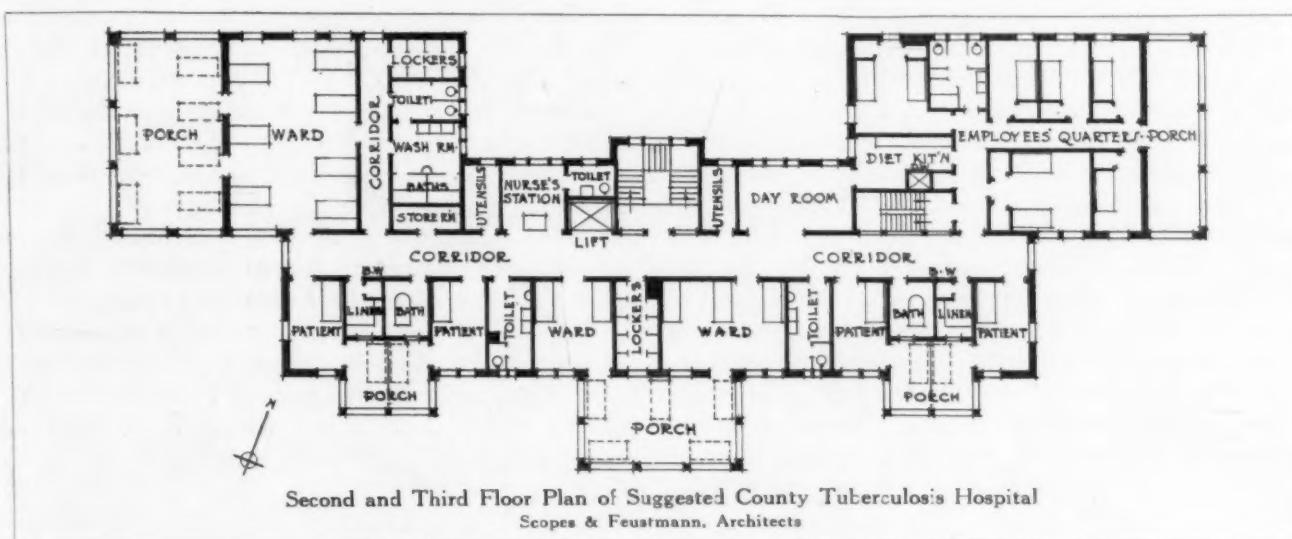
bution of beds in wards and rooms of various capacities as indicated on the plans ought to permit the physician the greatest possible leeway in placing his patients according to the degree of the illness and idiosyncrasy of the individual. It is intended, however, that the earlier cases will be taken care of in the west wing. These wards with sleeping porches, wash-rooms and baths, and other accessories, really form a separate housing unit. The severest cases will be taken care of in single rooms, which will have individual porches. While ample porch space has been

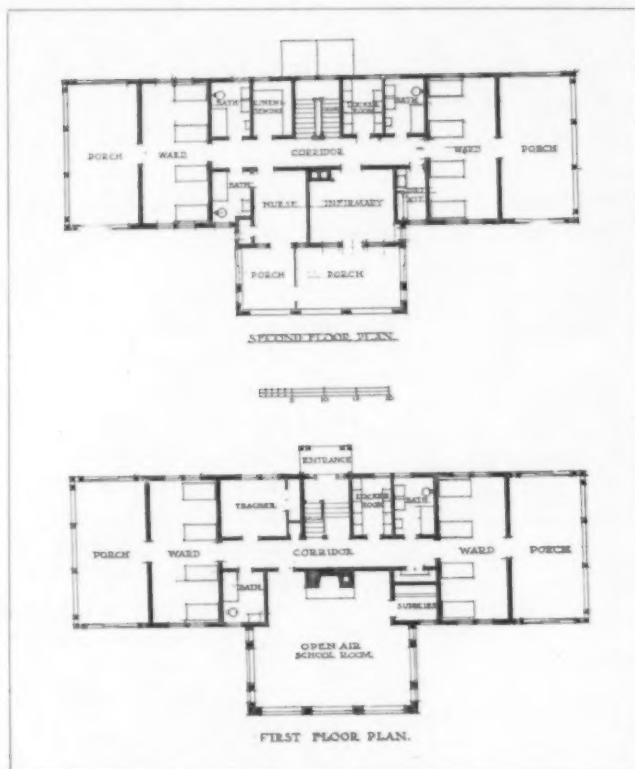
allotted each patient, every effort has been made to shade the wards and rooms as little as possible, introducing not only direct light, but sunlight as well. The value of such an arrangement is minimized by some physicians, but if there is any efficacy at all in the disinfecting value of sunlight and fresh air, then it would appear well worth while to strive for the arrangement just



### Floor Plan of Open Dormitory Type

described, which the authors believe to be the keynote of tuberculosis hospital planning. The psychic effect of cheerful and sunny interiors need hardly be enlarged upon at this late day. It will also be noted that practically no room of importance is shaded from direct light. Corridors have been made as open as possible without sacrificing economy in planning. It is to be regretted that institutional planning in respect to communications has not reached the stage of development in this country that is evidenced in European institutions where corridors are usually made open on one side. It is to be hoped that the desirability of such planning will be recognized at a not too far distant date by the medical profession, not alone in tuberculosis hospitals, but in general hospitals as well.





Floor Plans of Children's Unit in  
County Tuberculosis Hospital Group

There is a diet kitchen on each hospital floor and, contiguous thereto, a moderate sized day room which may also be used as a dining room for those patients not quite well enough to go to the dining room, but who would prefer to be served at a table rather than from a tray in their beds.

The building is supposed to be flat roofed, which will give ample opportunity for an open sun porch in case it is desired to subject some of the patients to solar treatment for surgical tuberculosis, lupus, etc.

Regarding the growth of the institution, it is expected that it will proceed substantially upon the following lines: After the county sanatorium has demonstrated its ability to take care of thirty-two average cases and the educational propaganda has proceeded vigorously, it will then be prepared to receive a number of really incipient cases of the hardy type; perhaps, too, it will be able to house in simpler quarters those who have spent some time in the main building and whose condition will have become quiescent. It will then be well to provide for about sixteen of such cases, eight of each sex, housed separately, in one-story shacks or open air pavilions of the improved type. By the improved type is meant the placing of warm, comfortable dressing quarters with washing and toilet accessories directly back of the open wards so that patients need not subject themselves to the discomfort of walking the whole length of the cold

wards, which are sometimes quite long, before they reach a warm room. Each shack should also be provided with a small living room and an emergency room. The latter would permit accommodations for such patients who may be overtaken by a sudden hemorrhage or rise in temperature. Here they may be made comfortable until a place can be found for them in the main building.

The children of the county should also receive early consideration. Children are best housed in a separate building, and it is suggested having four wards in two stories, to take care of about eight of each sex; these wards to be arranged similarly to the seven bed wards in the main building with the necessary locker rooms, etc. The children's pavilions should have a moderate sized infirmary room for emergency cases and, above all, should be provided with one commodious room facing south, with sash so arranged as to make it practically an outdoor schoolroom so that the school work of the children, especially those that are in the incipient state, may not be interrupted. This work is to be in charge of a trained teacher, who, with another attendant, will have charge of this separate pavilion.

The question of occupation-therapy is also to be thought of. As funds will permit, a moderate sized workshop should be provided, having light and airy workrooms, a warm glue room, dark rooms for photographic work, small salesroom for the products of patients, etc., etc. Pending the construction of a workshop, such diversional occupations as basket weaving, bead work, mending, etc., may be done on the porches of the main building.

The layout such as here outlined is not an inexpensive one, nor is it intended to be, any more than the county courthouse is intended to be a cheap affair. But it is held that the scheme is not extravagant for the part which the county should play in the fight against tuberculosis when it starts out to build a sanatorium or hospital to house its indigent invalids. Tuberculosis hospitals for advanced cases should cost more per bed than general hospitals because:

First. Wards should not be as large as is permissible in general hospitals.

Second. Both indoor and outdoor accommodations are necessary for each patient.

Third. The system of construction adopted and the architectural treatment should be in no wise inferior to that adopted for the general hospital.

Fourth. If unattractive, cheerless and cheaply constructed buildings are erected, it will be found very difficult to keep the patient in the institution, which is not the least of the problem in the fight the county is to make against this insidious disease.

## Principles of Hospital Planning in View of Future Expansion

ILLUSTRATED FROM PLOT PLANS OF HOSPITALS DESIGNED BY RICHARD E. SCHMIDT  
GARDEN & MARTIN, ARCHITECTS

By RICHARD E. SCHMIDT, A. I. A.

WHEN the problem of designing a new hospital or the expansion of an existing hospital is entrusted to an architect, it is necessary that he study and analyze the needs of the community in which it is to be built in the following respects: the rate of increase of bed-patients, the numbers treated in the several classifications of diseases and ailments, the past work of an existing institution, and also the probabilities of financial support for a long term of years, holding in view sufficient elasticity to permit of a change in proportion in the probable number of patients, according to the several classifications and to accommodate the ever changing methods of treatment and technique of medicine and surgery. The architect should also examine the surroundings of the site to ascertain the line of least resistance in the acquirement of additional neighboring property if available statistics indicate a probable growth beyond the confines of the site in at least twenty-five years and develop the ultimate scheme accordingly. All of this must be done in accordance with the most advanced practice of medical service to develop the site to its highest and best use subject to the most modern practice of hospital design.

The sketch studies will be made *en bloc* based on roughly pre-determined units of subdivisions with the necessary auxiliaries, holding in view an ultimate generally pleasing aspect. This the architect should be able to do from ground plans, without developing elevation and details, for clients will, in very rare exceptions, only, be willing to pay for the service of complete plans of the ultimate scheme.

Inasmuch as it is beyond human possibility to anticipate the advances in medical treatment and

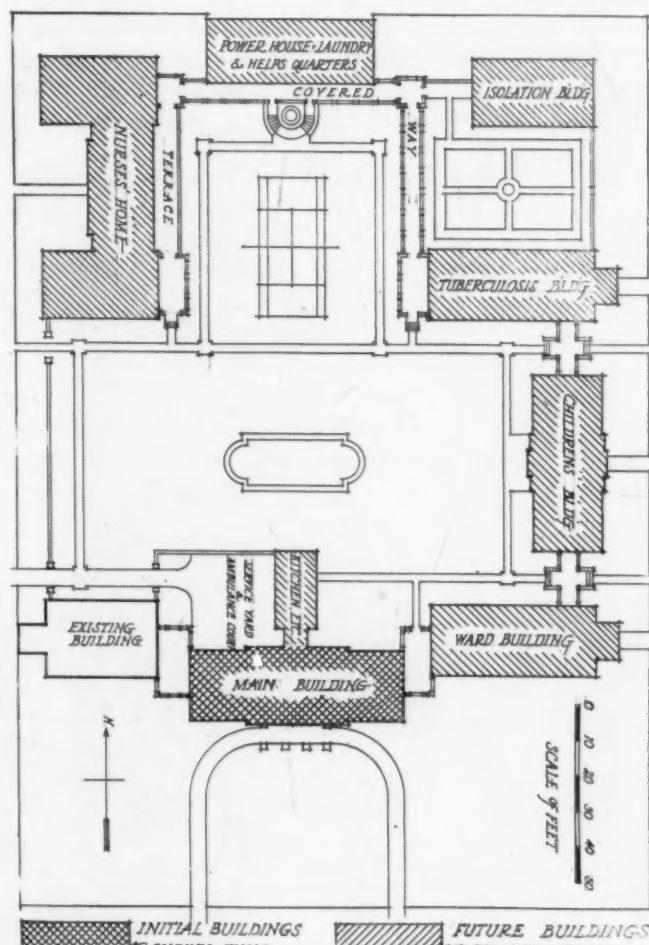
building improvements for a long term of years, it would probably be money unwisely expended to develop the complete scheme.

The principal element is to provide for a complete efficient operating hospital in its ultimate development with proper and convenient circulation without sacrificing these same necessary requirements in the portion, sometimes comparatively small, which is to be built and operated as the first unit.

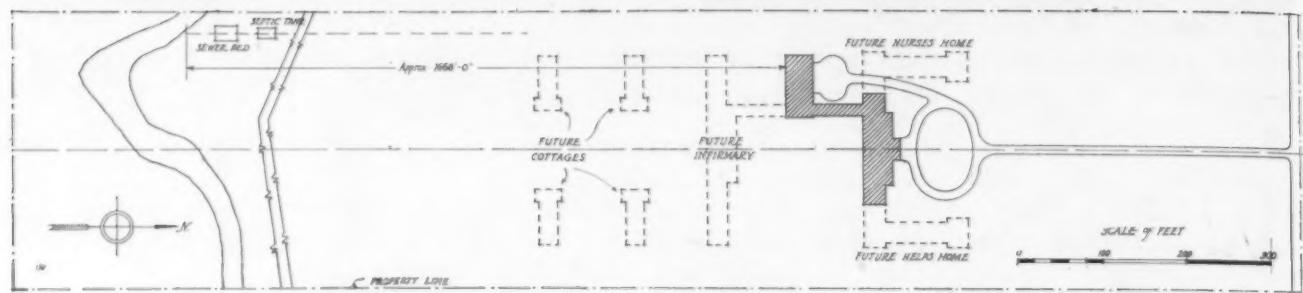
It is obvious that this presents the greatest difficulty and opportunity to the designer, *i. e.*, to provide all of the auxiliaries and services in proper proportion to the original and smaller number of patients, without being out of balance in dimensions, and consequently in its cost as compared to that small number, and to arrange the most important parts so that they will be suitably and properly located for an increasing number of patient beds, thus eliminating the possible requirement of their complete removal and an expensive rebuilding of the original section, when the time for enlargement arrives.

The wing which is first built must be convertible, floor by floor into rooms or wards for special purposes. Corridors must be placed to connect properly with additions, stairs and elevators so that they can remain where placed at the beginning and yet be quite conveniently placed for satisfactory and efficient use after enlargement.

The comparatively small principal entrance and business offices of the first section will in some instances (see plan of Columbia Hospital, Milwaukee, Wis.) be converted into a side entrance in the amplified building, some rooms and spaces will have to be devoted to functions for which they may not be perfectly adapted in dimensions and location in the first



Plot Plan, Lafayette Home Hospital, Lafayette, Indiana



Plot Plan of Adams County Tuberculosis Sanitorium, Quincy, Illinois

portion to be built, and again some of the departments, such as the operating sections, which are expensive to install, should be so located that they can be expanded without removal, or easily converted for the use of a special department such as the delivery rooms of a maternity section.

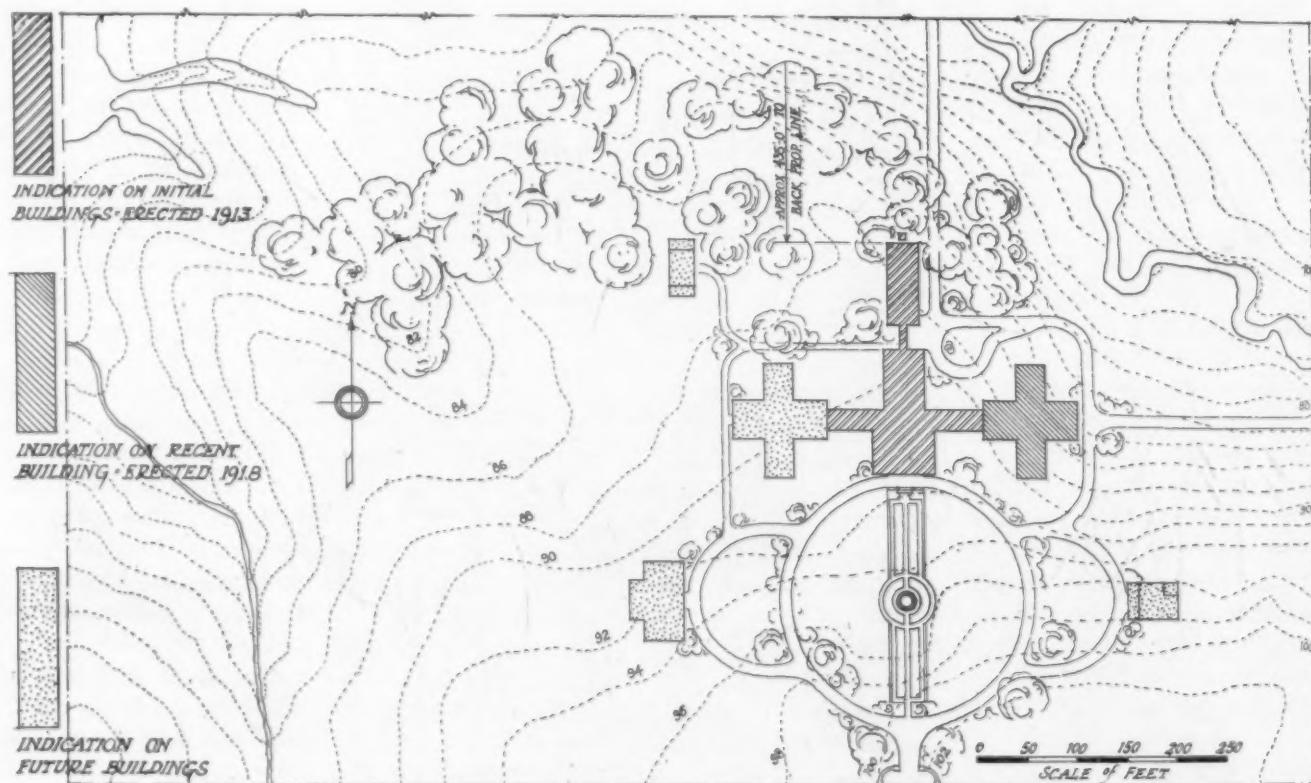
If the beginning is comparatively small, the kitchen, laundry and heating units may have to be placed within the first unit, proportionate to the required service, or, in inexpensive one or two-story additions which can be sacrificed by removal without too great a loss when the time arrives to build a separate service and power building, keeping in mind a convenient and efficient point of connection of heating, water and electric services as well as all other services. (The beginning of Columbia Hospital, Milwaukee, Wis., and Home Hospital, Lafayette, Ind., are planned on this basis.)

Obviously, a separate building of this kind, if

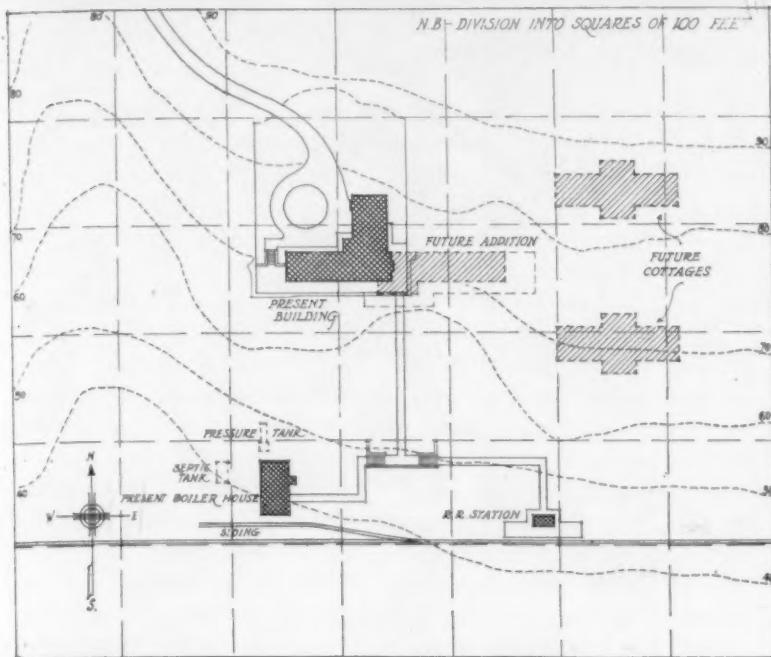
built at the outset, would overbalance the original patient capacity in size and cost, and in some instances would cost more than the funds available for the entire first unit.

If, however, the portion which is built at the inception of the scheme is a considerable proportion of the ultimate size, the service building may be built of sufficient dimensions, with ample space for the later installation of additional boilers, machinery, kitchen and laundry equipment to provide, with the original installation, the necessary service for the completed scheme. (See block plan of Decatur and Macon County Hospital, Decatur, Illinois.)

The Illinois Central Hospital at Paducah, Ky., the Pureair Tuberculosis Sanitorium, near Bayfield, Wis., and Adams County Sanatorium at Quincy, Ill., are compromises of the two methods described for the present and future accommodations for the service equipment.



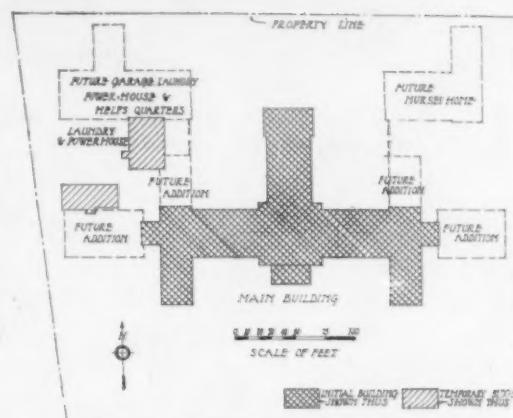
Plot Plan of Decatur and Macon County Hospital, Decatur, Illinois



Plot Plan of "Pureair," County Tuberculosis Hospital near Bayfield, Wis.

It will be proper generally to arrange temporary quarters for the services if the initial hospital is to have a capacity of less than fifty per centum of the ultimate.

The foregoing statements are more definitely applicable to the low pavilion type, than they are to the high city hotel block plan type, which, happily,

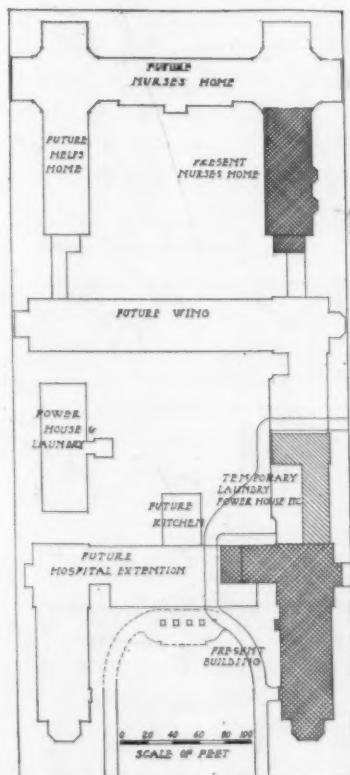


Plot Plan of Illinois Central Railroad Hospital, Paducah, Kentucky

appears to be declining in popularity. The latter can be built to sustain additional stories and presents comparatively few difficulties to increasing its capacity.

The architects' problem is, therefore, to place the foundations of the institution in such a manner that the larger part of the first portions to be built will endure and serve all practical purposes throughout many years.

As stated at the beginning, the success of such planning will depend upon investigations made at the start relative to the probable growth of the institution, and the foresight with which the principles of administration are determined for the building's operation.



Plot Plan, Columbia Hospital,  
Showing Future Growth



View of Columbia Hospital, Milwaukee, Wisconsin, Showing Temporary Power Building  
and First Unit of Nurses' Home

# The William Wirt Winchester Memorial Hospital, New Haven, Conn.

SCOPES & FEUSTMANN, ARCHITECTS

THE William Wirt Winchester Memorial Hospital was designed for the treatment of advanced tuberculosis. The objects to be attained have been described so well by Prof. George Blumer in an address at the dedication exercises, that a portion of his remarks are quoted.

"When nine years ago the directors of the New Haven Hospital received the preliminary gift for the care of tuberculous patients, the first question which they had to decide was the use which should be made of the fund. While the laity are apt to think of tuberculosis as mainly a disease of the lungs, the medical man realizes that this is by no means the case. In childhood particularly, other structures such as the bones and joints and the lymphatic glands are likely to be attacked, and a fund for the care of tuberculous patients can therefore be put to a variety of uses. The executive committee of the hospital, feeling that a grave responsibility rested upon them, obtained through correspondence the opinion of the leading experts in tuberculosis in the United States, and the unanimous conclusion of these experts was that the fund would be best used by caring for advanced cases of pulmonary tuberculosis. It was pointed out by those whom we consulted, that in the first place these are the patients who are mainly responsible for the spread of the disease. It is chiefly through the dried expectoration of the patient with pulmonary tuberculosis that the germs of the disease are disseminated. It was also pointed out that at that time the tendency in the United States had been toward the establishment of sanatoriums for early cases rather than hospitals for advanced cases. This tendency has been decidedly modified in recent years,

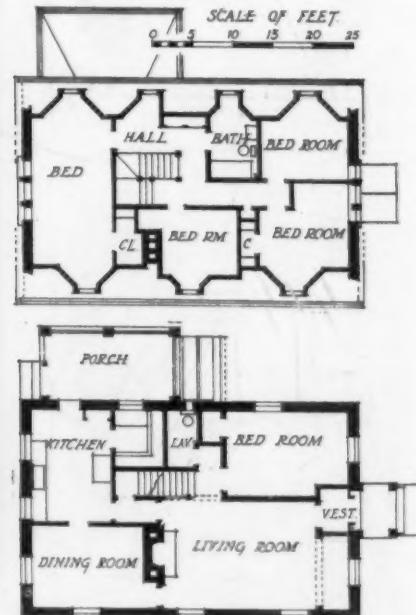
in this state particularly, among others, by the establishment of state sanatoriums caring for patients in all stages of the disease. It is still, nevertheless, a fact that the number of hospital beds available for the care of patients in advanced states of the disease is far from adequate.

This hospital, therefore, was planned particularly for the care not of incipient tuberculosis, but of advanced tuberculosis. Its purpose necessarily influenced the type of construction adopted. Advanced cases of tuberculosis are usually bedridden, are often seriously ill and in short require just the same sort of hospital care as cases of typhoid fever, of pneumonia or other acute illnesses. On the other hand certain patients with advanced tuberculosis show remarkable powers of recuperation. There is no chronic disease perhaps regarding which the prognostic judgment of the physician is more likely to be at fault than chronic pulmonary tuberculosis. Furthermore even advanced cases of pulmonary tuberculosis are not all equally ill and do not require exactly the same sort of care, and these facts had an influence on the type of construction that this hospital presents.

The general plan of the hospital is of the so-called pavilion type and, as is usually the case, the administrative structures are placed as near to the center of the plant as possible. For the treatment of patients two types of structure are provided. The two wings which are nearest to the center of the building represent one type and the two buildings most remote from the center represent another. The buildings nearest to the center are planned for the care of the more advanced cases. The important feature of these buildings is that there are no very large wards, most

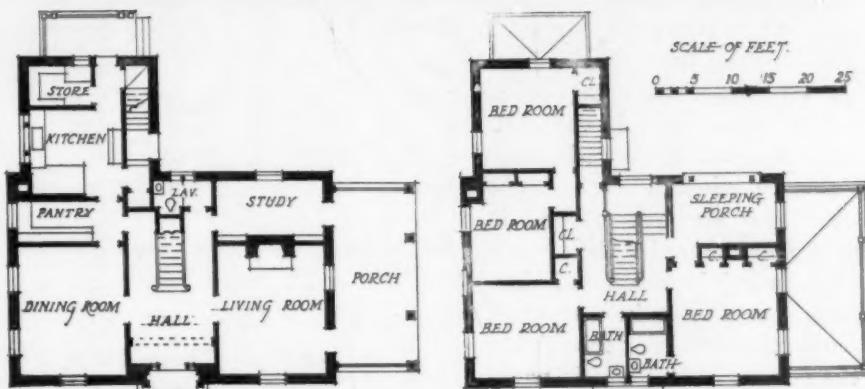


Floor Plans and Exterior View of Gardener's Cottage



of the patients' space being taken up by rooms holding from one to two or three beds. There is room on the porches for every patient in the institution. The buildings which are farthest from the central administration represent what is commonly spoken of as the shack type. In these buildings the patients are expected to live and sleep outdoors entirely, except in bad weather, so that the structure consists essentially of a large porch which communicates with the heated dressing rooms and a living room which may be used in severe weather. These buildings are to be used by patients who are not bedridden and they present from the patient's point of view, the element of hope. A patient may be admitted in a bedridden state and there is always a chance that recovery will take place to such an extent that he can be transferred to the shacks and thus be encouraged and stimulated so that further improvement will occur."

The planning was definitely influenced by certain other considerations. As the site embraced a considerable area suitable for the placing of the hospital buildings, it was felt that they should not be over two or three stories in height to secure the best results in architectural treatment as well as a most satisfactory arrangement for housing the patients. One of the most difficult features to handle in designing tuberculosis hospitals and sanatoriums is the necessary porches, and when these are over three stories in height it is almost impossible to find suitable precedent for the correct architectural expression of these features. The site chosen is a beautiful one and most admirably suited to the purpose. When the fact is borne in mind that the institution is for the treatment of indigent advanced cases, the many advantages of the site are apparent. It is within a single carfare trolley ride of New Haven. The elevation, while ample in relation to immediate surroundings, is not too difficult of negotiation for those not in most robust condition. It is thus a simple matter for friends, members of the family and relatives to visit the patients, a factor of great importance in making the invalid happy and contented and willing to remain in the institution. This is not so essential where patients are in the incipient stage of the disease and



Chief Physician's House, William Wirt Winchester Memorial Hospital

are treated in sanatoriums, as distinct from hospitals, because they are up and about and apparently as well as other individuals and able to seek diversion and employment to pass the time.

The site is bounded on the north by a railroad cut of the Berkshire Division of the New York, New Haven and Hartford Railroad, the tracks of which are about twenty-seven feet below the highest grade level of the site. If the service or basement and first floor of the main group of buildings could be kept down to certain levels, a railroad siding for cars delivering fuel direct to bunkers, and other supplies direct to a delivery platform, was possible. This was later accomplished in the planning by starting the siding a considerable distance west of the power house and using excavated material for embankment fill.

The indicated location for the main entrance was toward the east and the contours and points of the compass determined the disposition of the patients' quarters, and these two factors created a natural division at the entrance between the administration and service department on the one hand and the patients' quarters and medical department on the other.

With the above explanations, the reasons for many features of the planning will be apparent. A brief outline of some of these features follows:

Accommodations for one hundred and thirty-six patients on the south front in wards and rooms of varying sizes, including one, two, three, eight, and nine-patient units, to suit different stages of the disease as well as the diverse characteristics of the patients.

Four separate dining rooms for patients near their rooms and wards with service from diet kitchens adjoining.

Service to the diet kitchens by means of a service corridor in the basement (which connects all of the main group of buildings) and electric dumb waiter from the main kitchen on the third story of administration building to the service corridor.

Medical examining rooms, throat treatment rooms and dental rooms in ward wings.

A complete operating suite and laboratory suite in the west ward wing well removed from the service wing.

An X-ray department and a drug department in the basement of administration building adjacent to the main elevator.

Storerooms of various kinds at the service end of administration building basement.

A diet kitchen in service wing for instruction in dietetics, of pupil nurses.

Quarters for internes with sitting rooms, etc., are on the second floor in the central part of administration building.

Male helps' quarters are provided on the second and the third floors in central portion of administration building.

Female employees are housed at the north end of service wing in both second and third stories.

Nurses' Home, accommodating twenty-six nurses, with sleeping porch accommodations for a large proportion of these. It was felt that many of the nurses might be cured tuberculous patients.

A physician's cottage for the physician in chief of the institution.

A gardener's cottage, which also serves as a lodge at the main entrance gates.

A power house containing a complete isolated plant consisting of high pressure boilers, engines and generators, refrigerating machinery, ice-making room, incinerator, etc., and above this, a complete laundry suitable for a three or four hundred patient institution.

The matter of water supply and fire protection was taken care of by the installation of a two hundred and

fifty thousand gallon concrete reservoir below the ground near the power house, to which level the water supplied by the New Haven Water Company flows by gravity. Pressure is obtained by means of a seventy-five thousand gallon elevated tank placed considerably to the west of the main group of buildings. For service purposes, only twenty-five thousand gallons of this supply can be drawn, the balance remaining as a constant supply to the eight-inch fire mains extending throughout the grounds and to the sprinkler system which is an extension of these fire mains and which covers all of the buildings except the physician's cottage and the gardener's cottage. The tank

supply is augmented by a heavy fire pump of ample capacity. While the power house and some of the service portions of the administration building are of fireproof construction, the balance of the buildings are of non-fireproof construction. Despite this fact a remarkably low rate of insurance was obtained through the installation of the complete sprinkler system.

The heating is by means of pumped hot water which is heated by the utilization of all exhaust steam. Direct radiation is used throughout.

There is a system of exhaust ventilation from certain rooms such as toilets, kitchens, serving rooms, operating room, etc. The ventilation of wards, patients' rooms and corridors is by means of open windows.

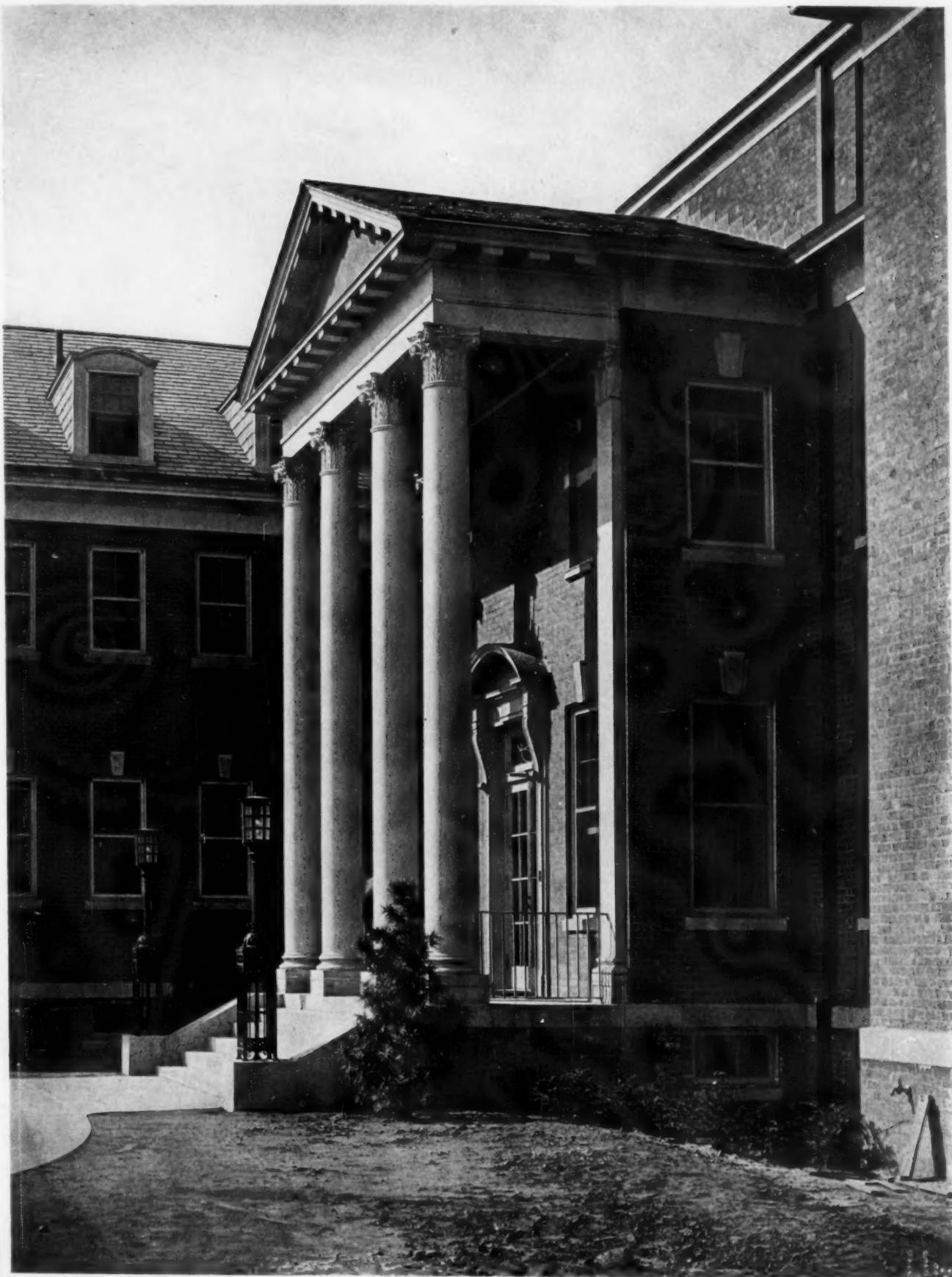
Materials used for the exterior are local selected red brick of good color with granite water table and Indiana limestone sills and key blocks. Wood is used for cornices and columns, and slate for the roofs.

The interior walls are finished with wood fibre plaster on plaster board. Door frames and base, except in nurses' home, dormitories and physician's cottage are of metal. For the finished floors, hard red tile was used in the machinery rooms, main kitchen and bakery, serving rooms, etc.; terrazzo in the laundry, diet kitchens and dormitory washrooms, and encaustic tile in the bath and toilet rooms and operating suite. The balance of the floors in corridors, patients' rooms, etc., are of narrow comb-grained Douglas fir covered with battleship linoleum, the entire area of which is cemented to the floor with waterproof cement. The ceiling heights are not extreme, an attempt having been made to create a homelike, rather than an institutional atmosphere.

The service and many of the administrative features in connection with the planning of the hospital were evolved by Dr. Simon F. Cox, superintendent of the New Haven Hospital.



First Floor Plan of Nurses' Home

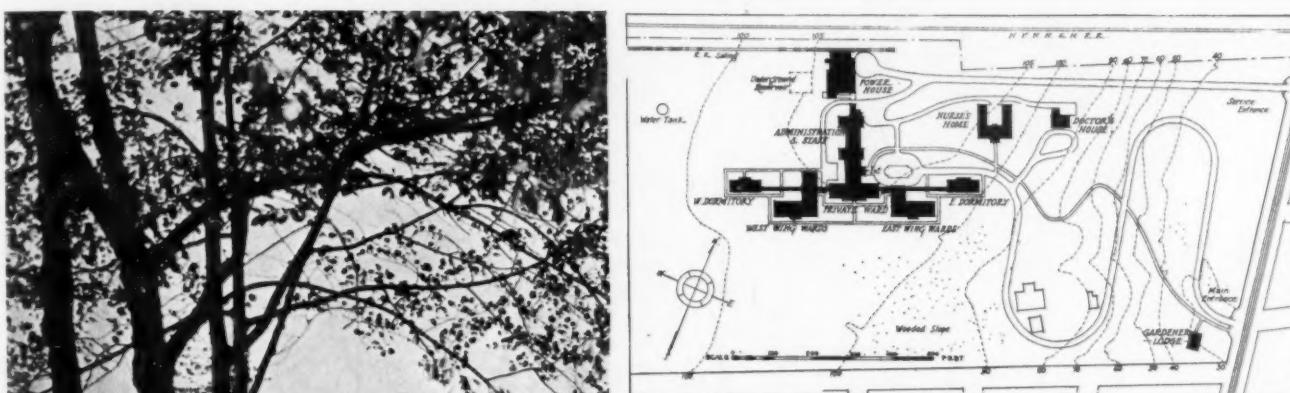


DETAIL OF ENTRANCE PORTICO  
WILLIAM WIRT WINCHESTER MEMORIAL HOSPITAL, NEW HAVEN, CONN.  
SCOPES & FEUSTMANN, ARCHITECTS





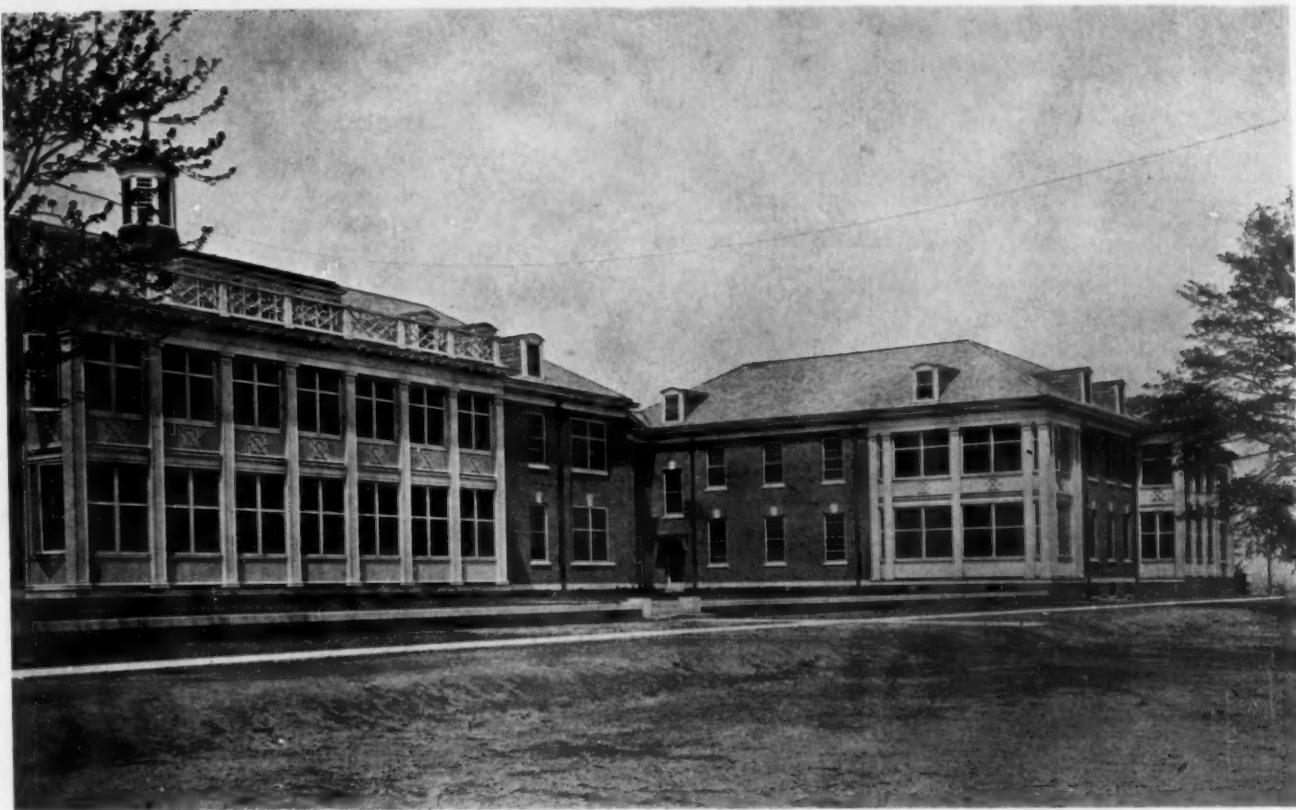
GENERAL VIEW OF WARD BUILDINGS FROM THE SOUTH



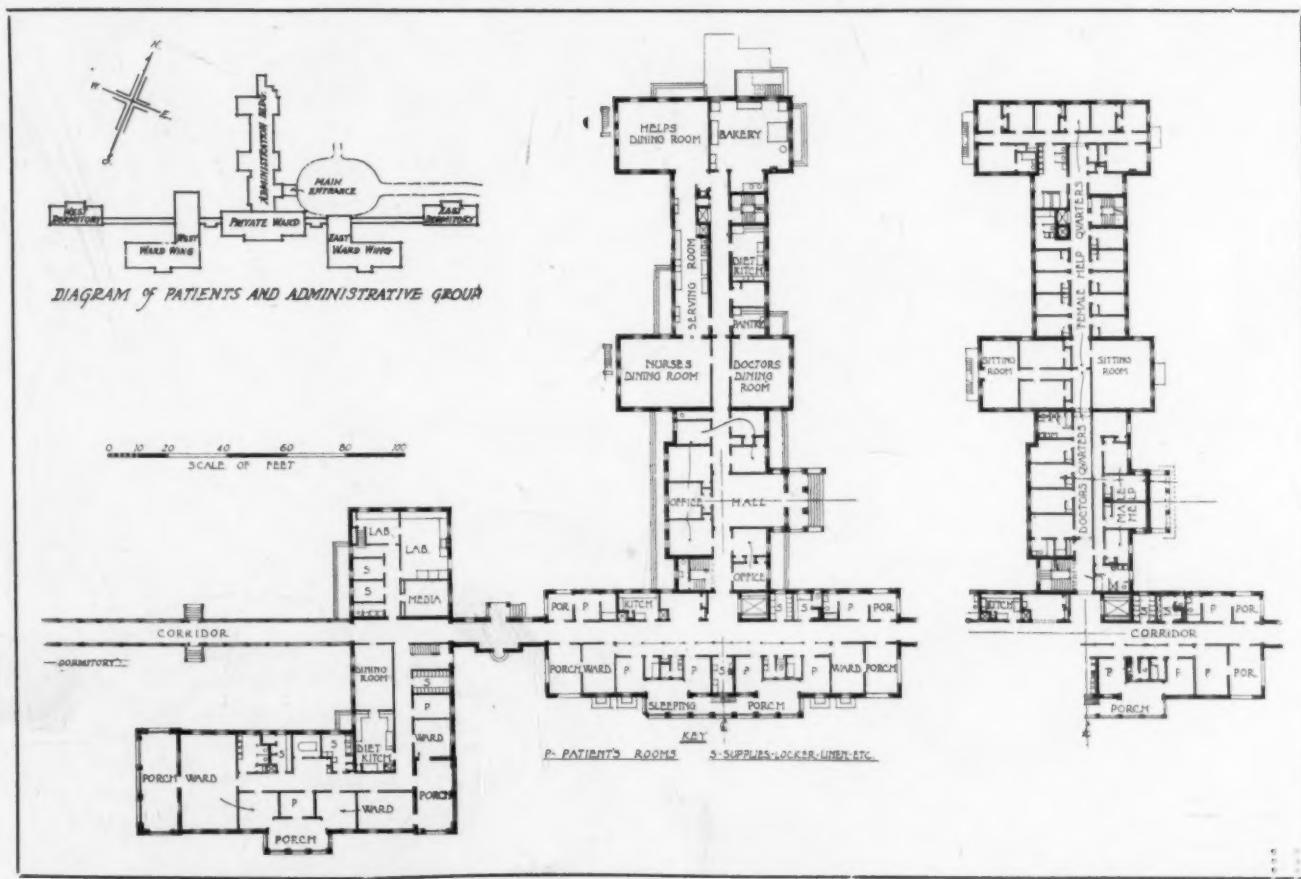
VIEW OF ADMINISTRATION BUILDING FROM ENTRANCE DRIVE

WILLIAM WIRT WINCHESTER MEMORIAL HOSPITAL, NEW HAVEN, CONN.  
SCOPES & FEUSTMANN, ARCHITECTS



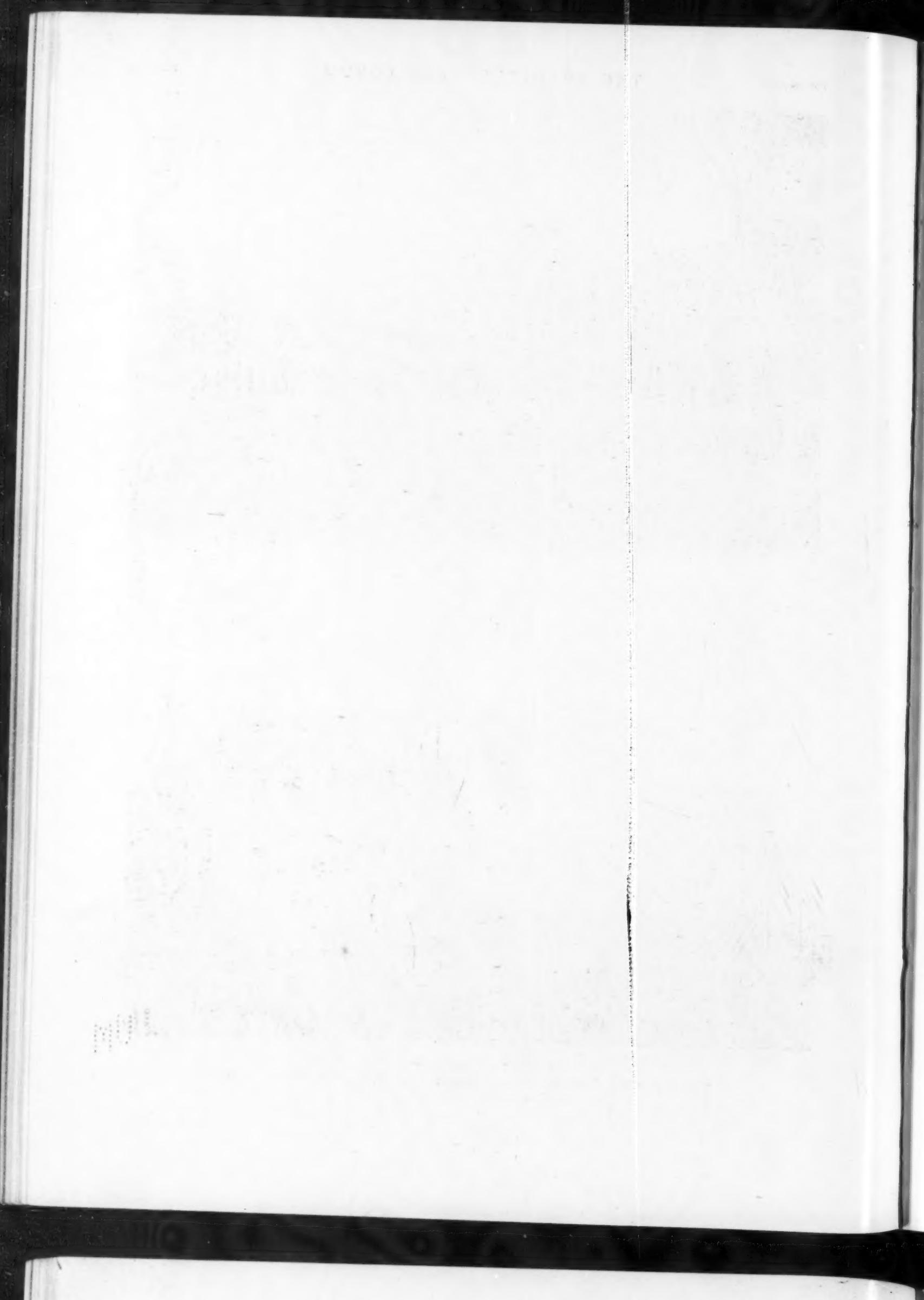


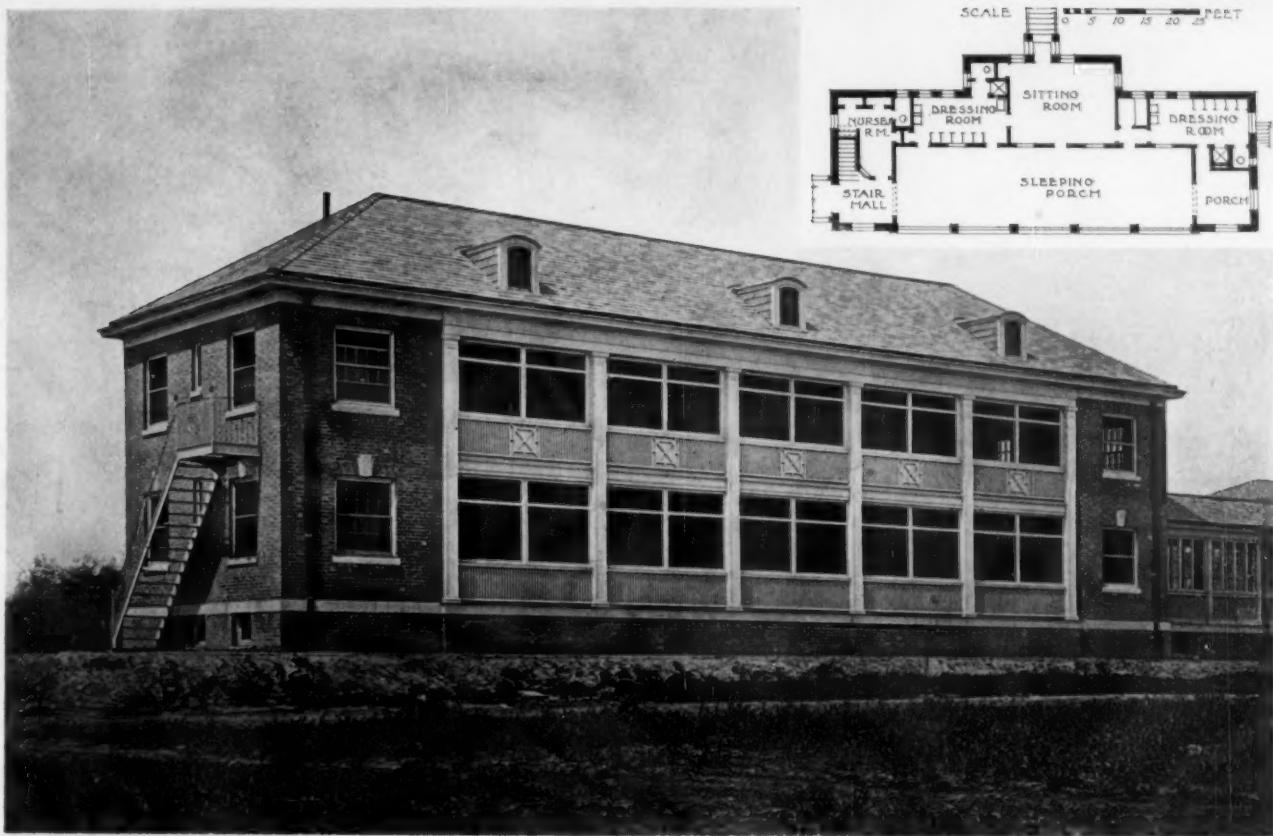
VIEW OF SOUTH FRONTS OF PRIVATE AND EAST WARD WINGS



WILLIAM WIRT WINCHESTER MEMORIAL HOSPITAL, NEW HAVEN, CONN.

SCOPES &amp; FEUSTMANN, ARCHITECTS





SOUTH SIDE OF OPEN DORMITORY WING



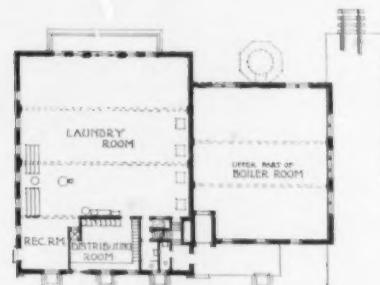
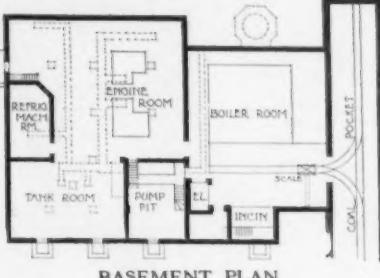
GENERAL VIEW OF NURSES' HOME  
WILLIAM WIRT WINCHESTER MEMORIAL HOSPITAL, NEW HAVEN, CONN.  
SCOPES & FEUSTMANN, ARCHITECTS





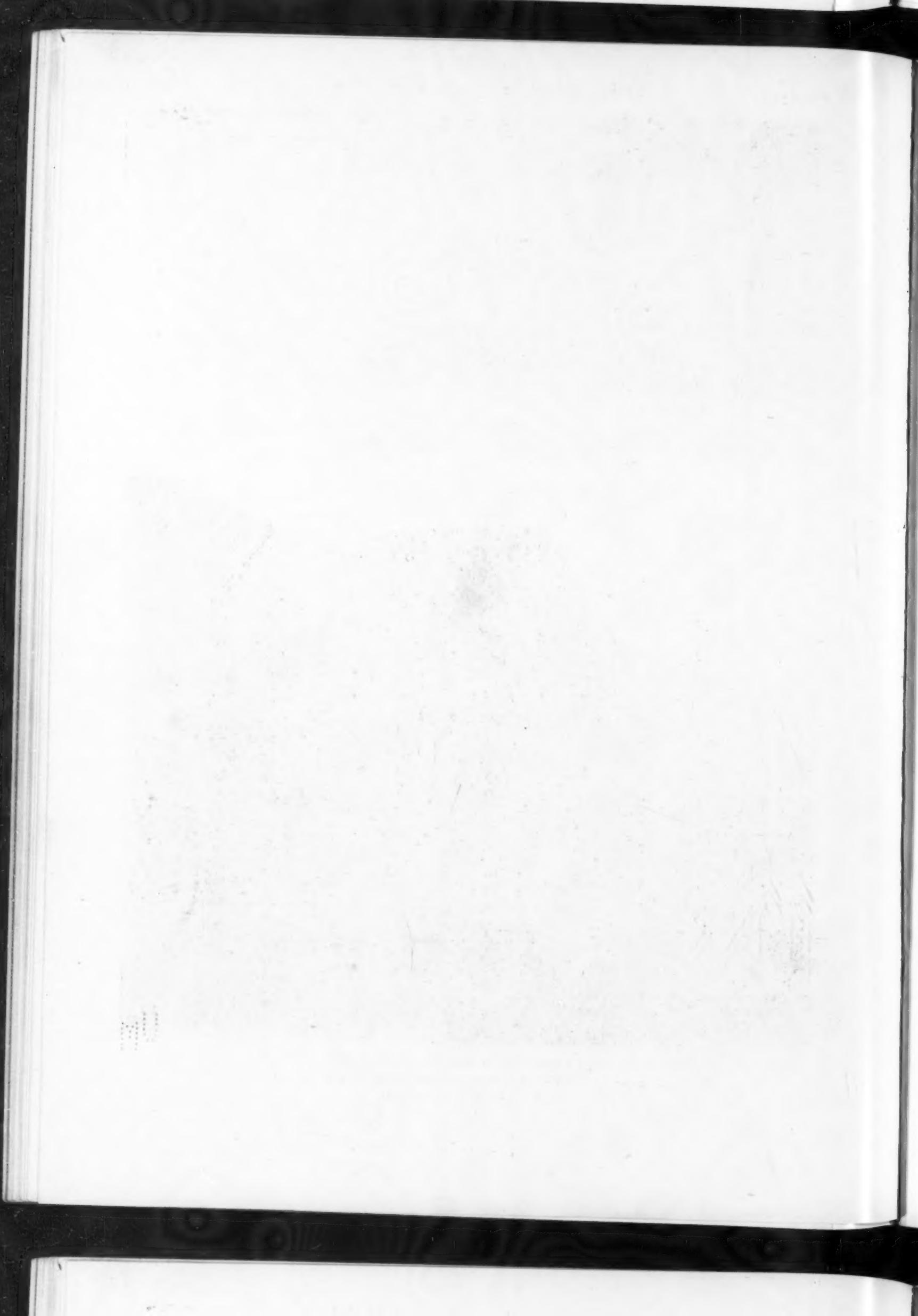
LAUNDRY AND POWER BUILDING

SCALE 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 FEET



ENTRANCE SIDE OF OPEN DORMITORY WING

WILLIAM WIRT WINCHESTER MEMORIAL HOSPITAL, NEW HAVEN, CONN.  
SCOPES & FEUSTMANN, ARCHITECTS



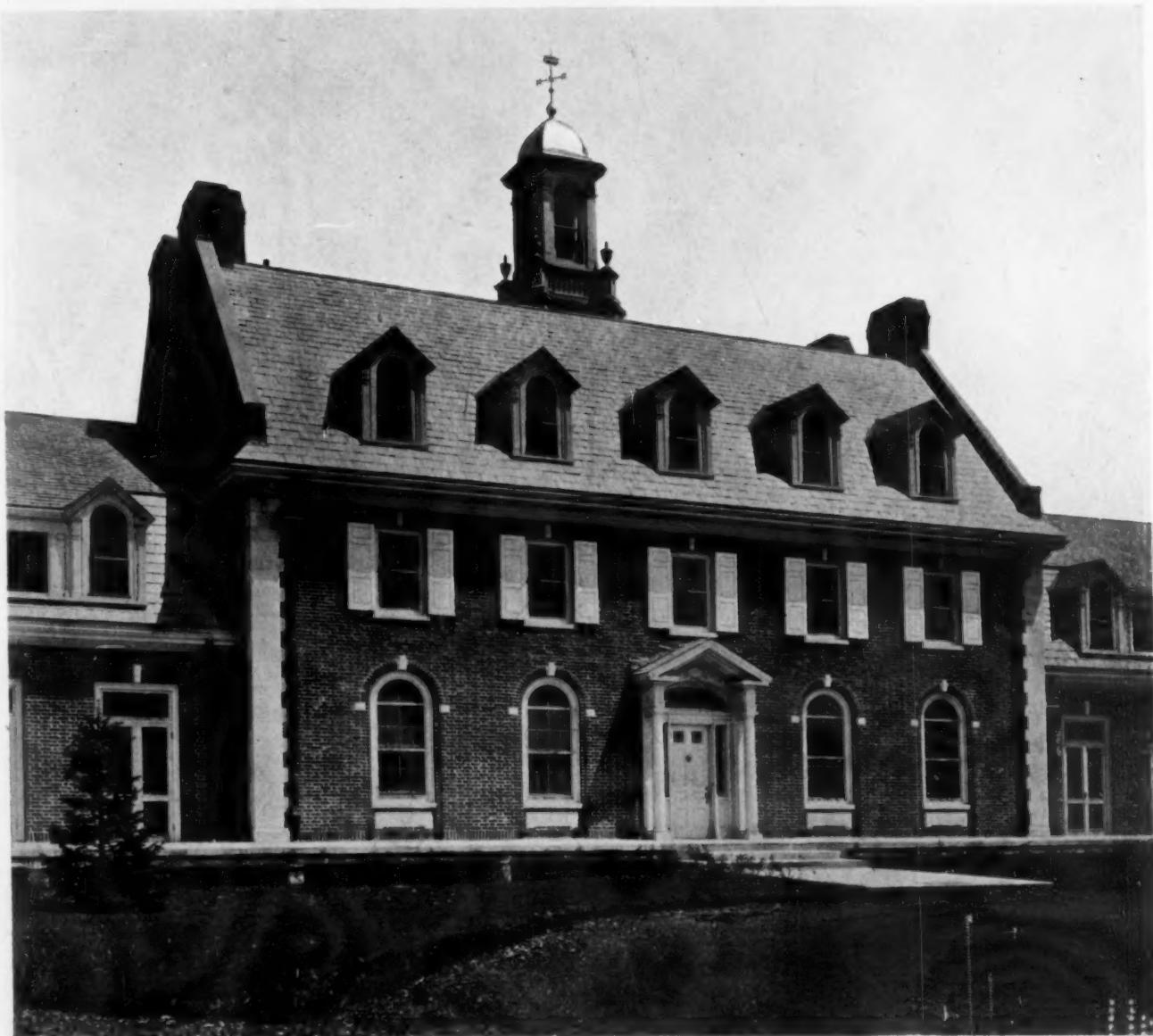
VOL. 30, NO. 6

THE ARCHITECTURAL FORUM

PLATE 86



GENERAL VIEW OF SOUTH OR MAIN FRONT

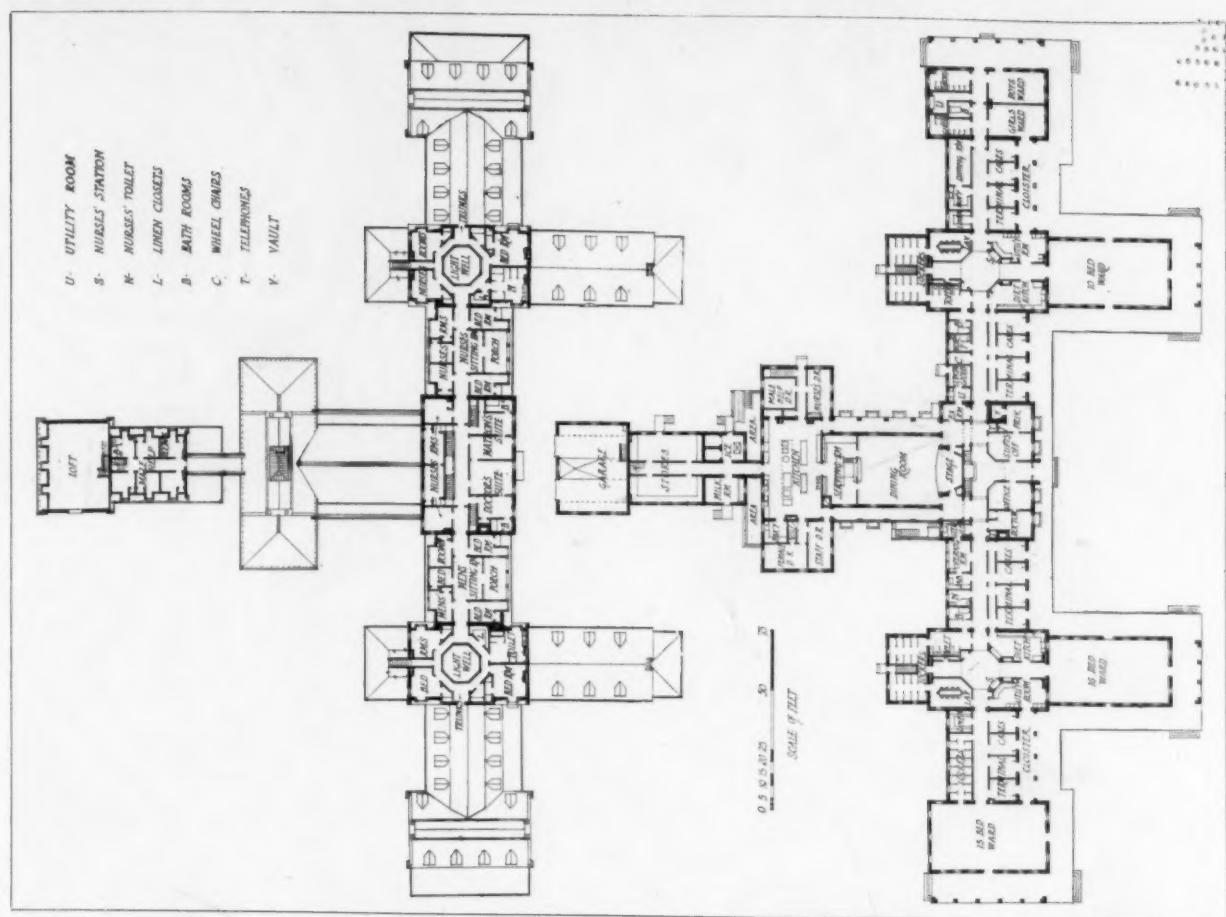


DETAIL OF ADMINISTRATION UNIT

NORFOLK COUNTY TUBERCULOSIS HOSPITAL, BRAINTREE, MASS.

✓ HAROLD FIELD KELLOGG, ARCHITECT





FIRST AND SECOND FLOOR PLANS

NORFOLK COUNTY TUBERCULOSIS HOSPITAL, BRAINTREE, MASS.

HAROLD FIELD KELLOGG, ARCHITECT



VIEW OF REAR SHOWING CORRIDOR CONNECTING  
ADMINISTRATION AND SERVICE DEPARTMENTS





VIEW OF SOUTHEAST END SHOWING CHILDREN'S UNIT



VIEW OF SOUTHWEST END SHOWING CLOISTER OUTSIDE TERMINAL ROOMS  
NORFOLK COUNTY TUBERCULOSIS HOSPITAL, BRAINTREE, MASS.  
HAROLD FIELD KELLOGG, ARCHITECT





DINING ROOM AND ASSEMBLY HALL.



TYPICAL WARD INTERIOR.

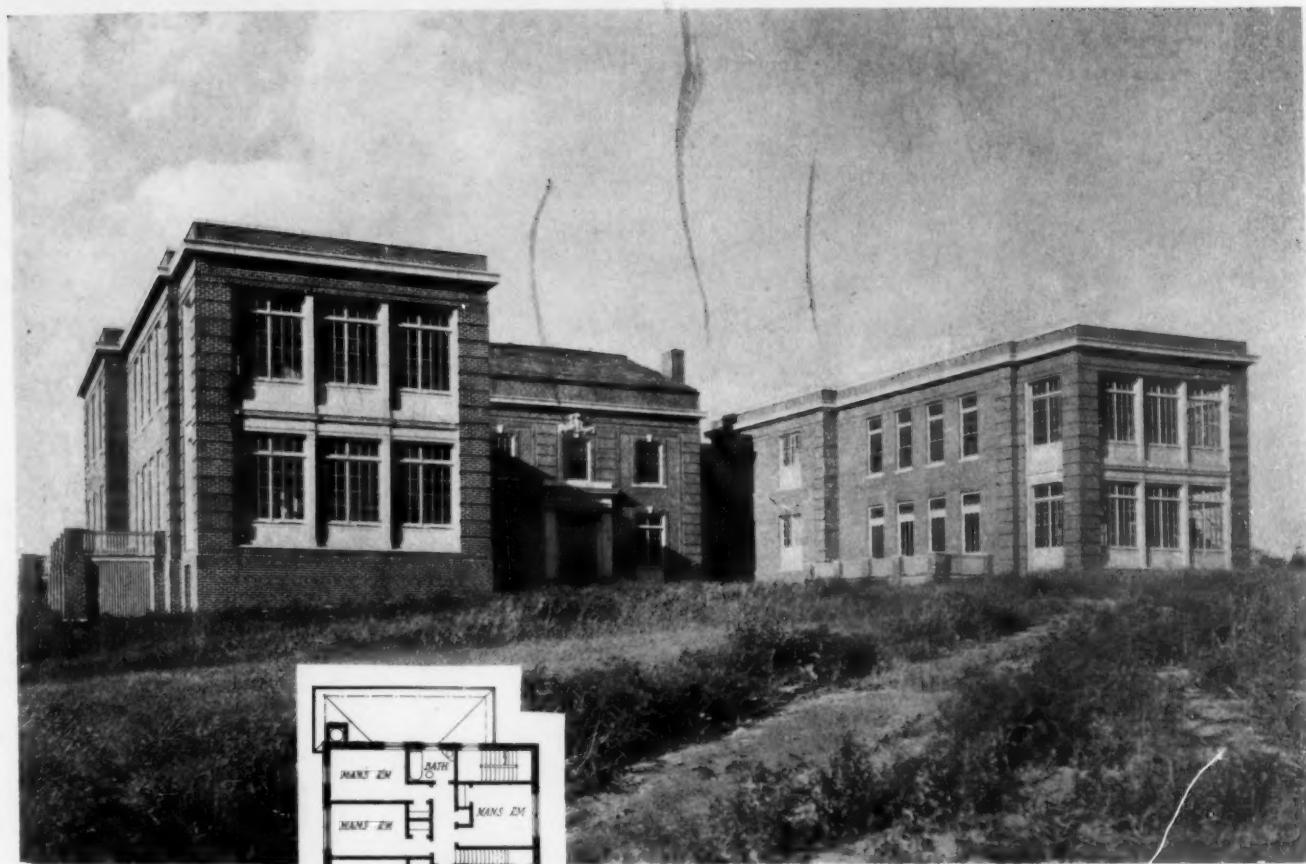


ENTRANCE HALL LOOKING TOWARD WARD CORRIDOR

NORFOLK COUNTY TUBERCULOSIS HOSPITAL, BRAINTREE, MASS.

HAROLD FIELD KELLCGG, ARCHITECT



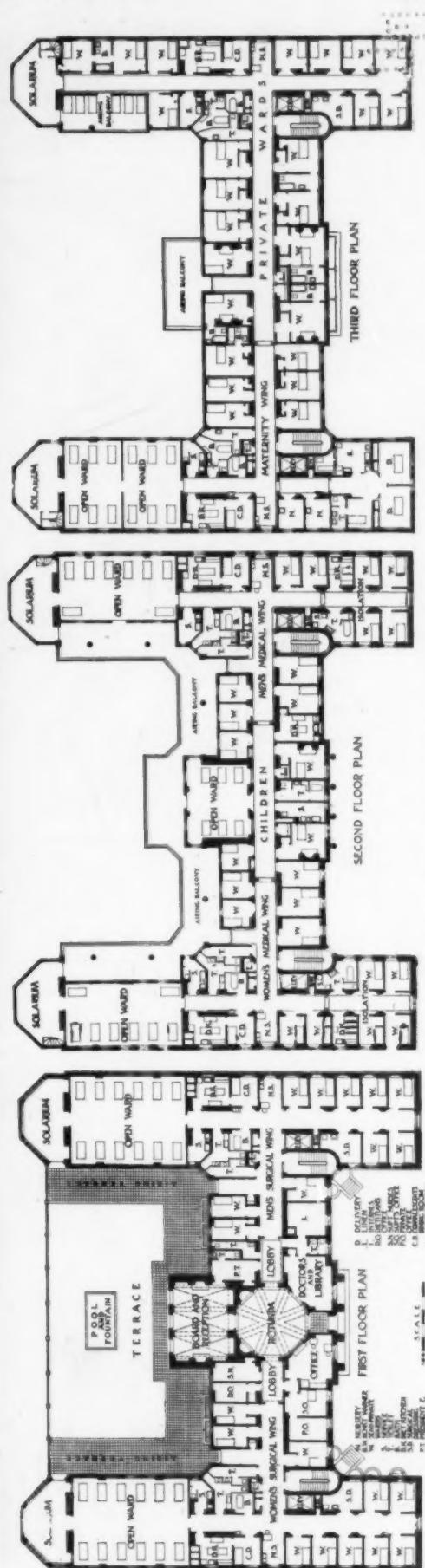


DETAIL OF ADMINISTRATION UNIT

TUBERCULOSIS HOSPITAL OF THE CITY OF CAMBRIDGE, MASS.

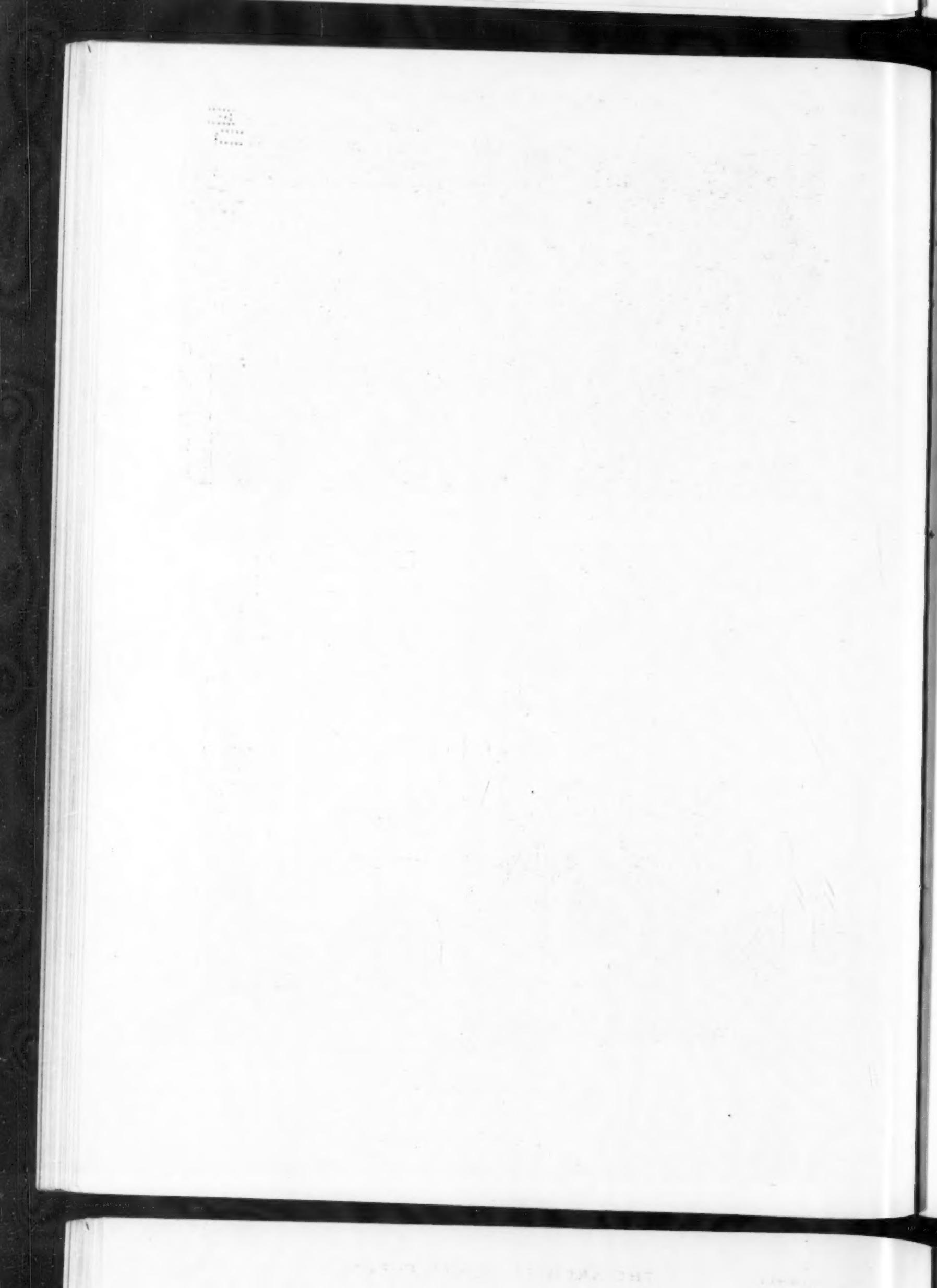
CHARLES R. GRECO, ARCHITECT

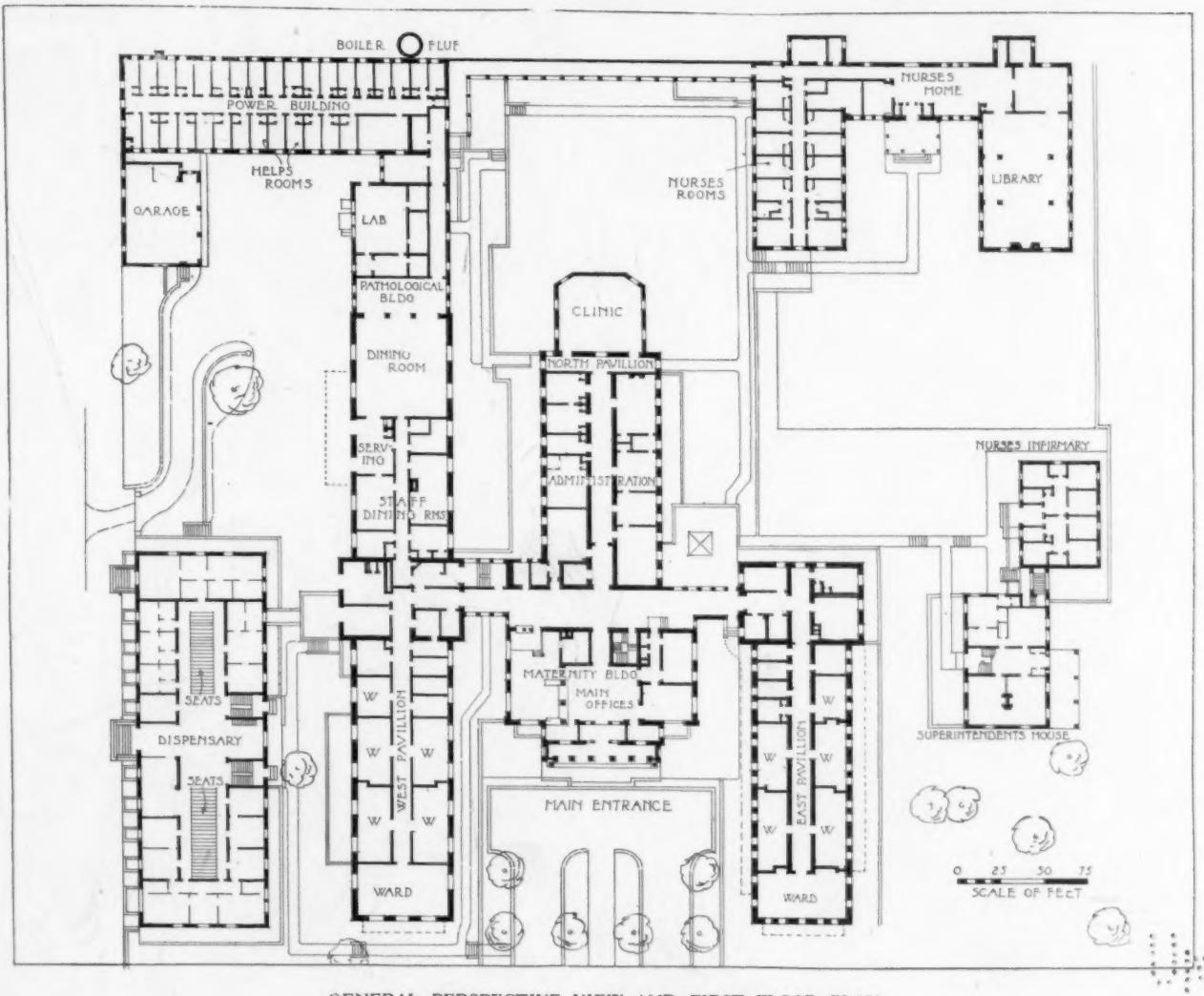
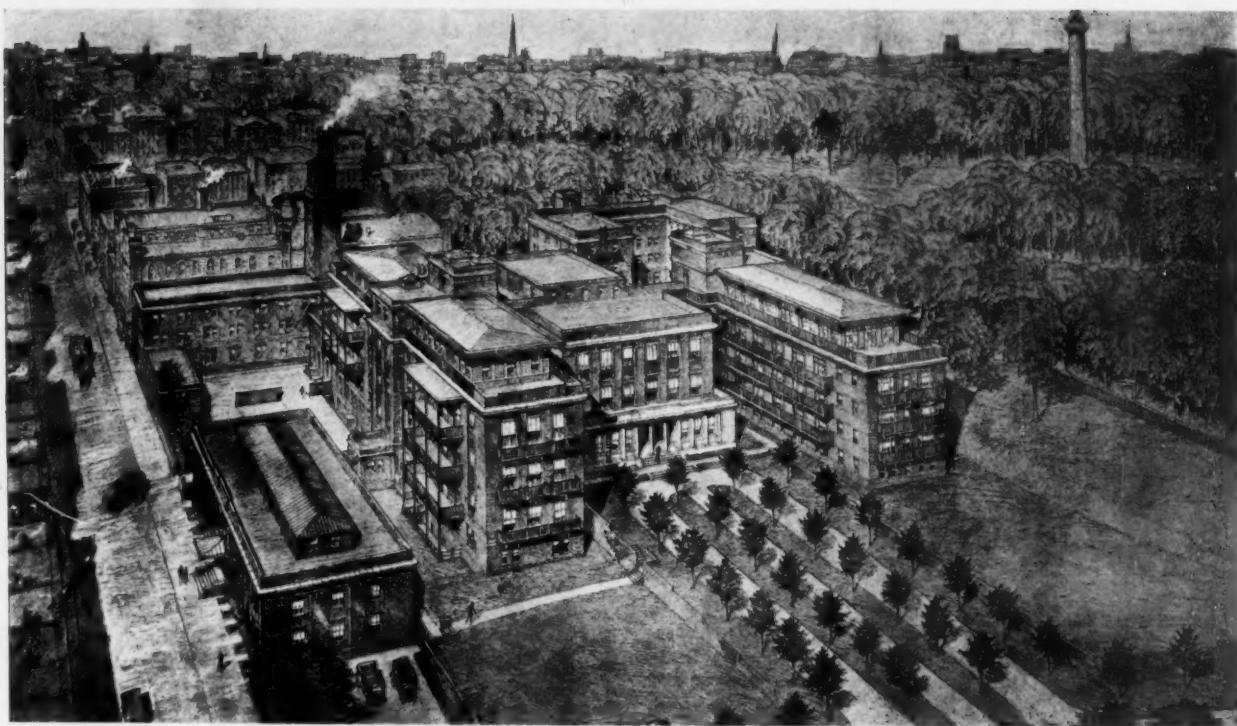




NORTH FRONT OF MAIN BUILDING, SALEM HOSPITAL, SALEM, MASS.

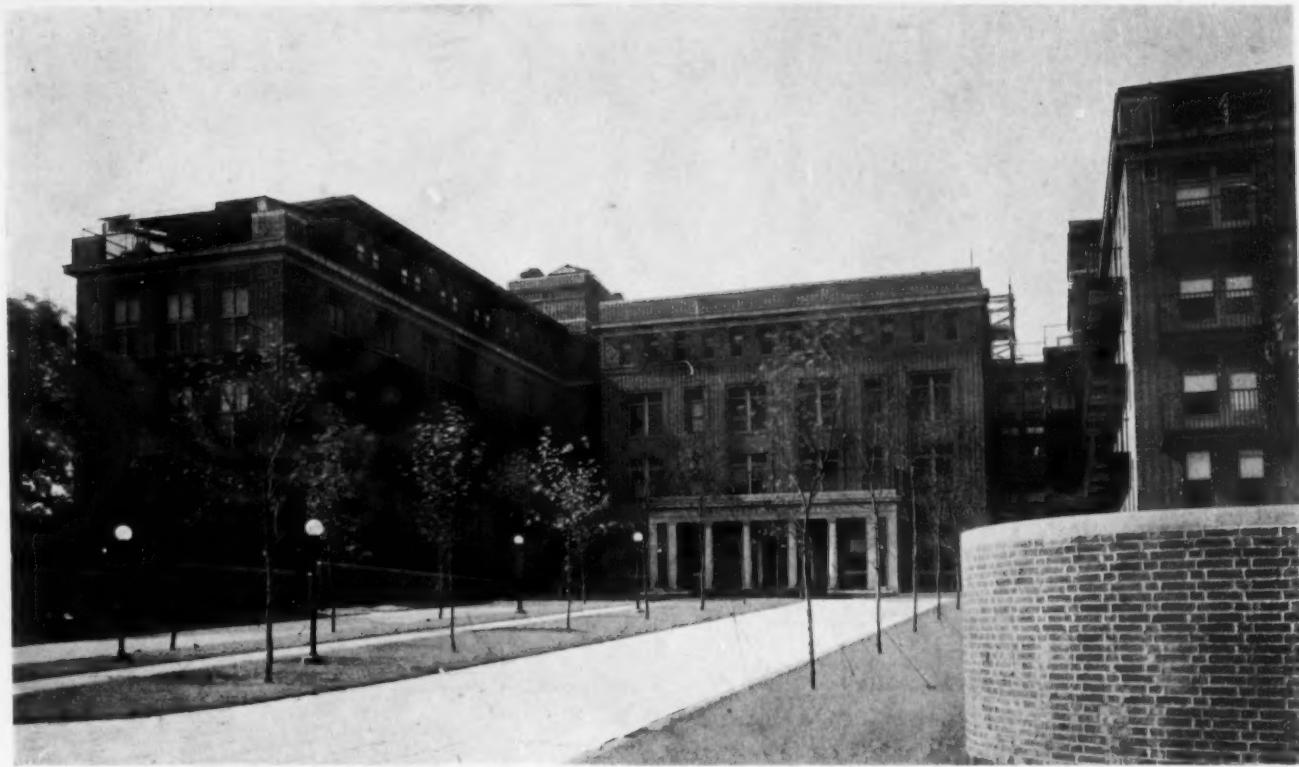
HAVEN & HOYT, ARCHITECTS



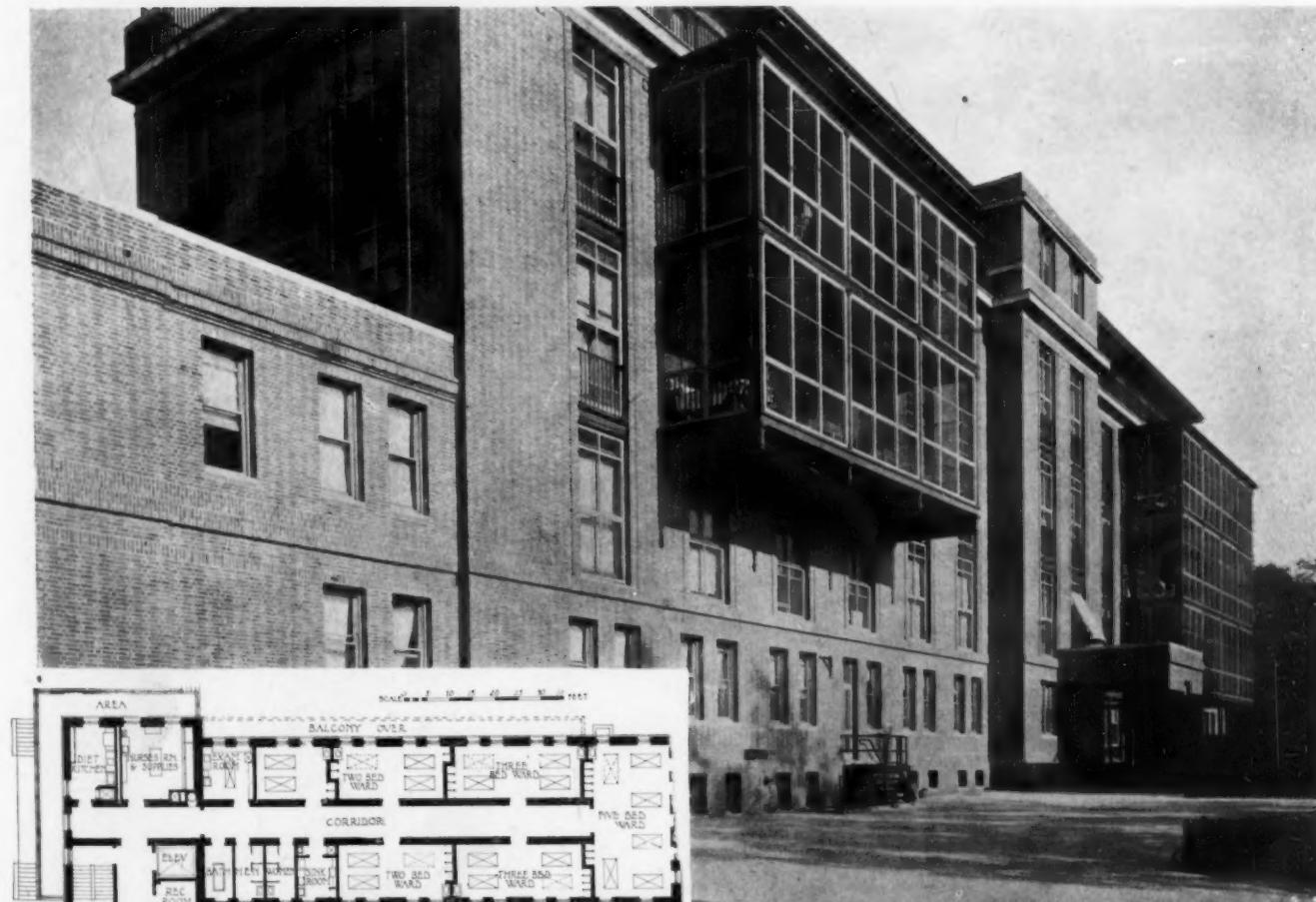


GENERAL PERSPECTIVE VIEW AND FIRST FLOOR PLAN  
BROOKLYN HOSPITAL, BROOKLYN, NEW YORK  
LORD & HEWLETT, ARCHITECTS

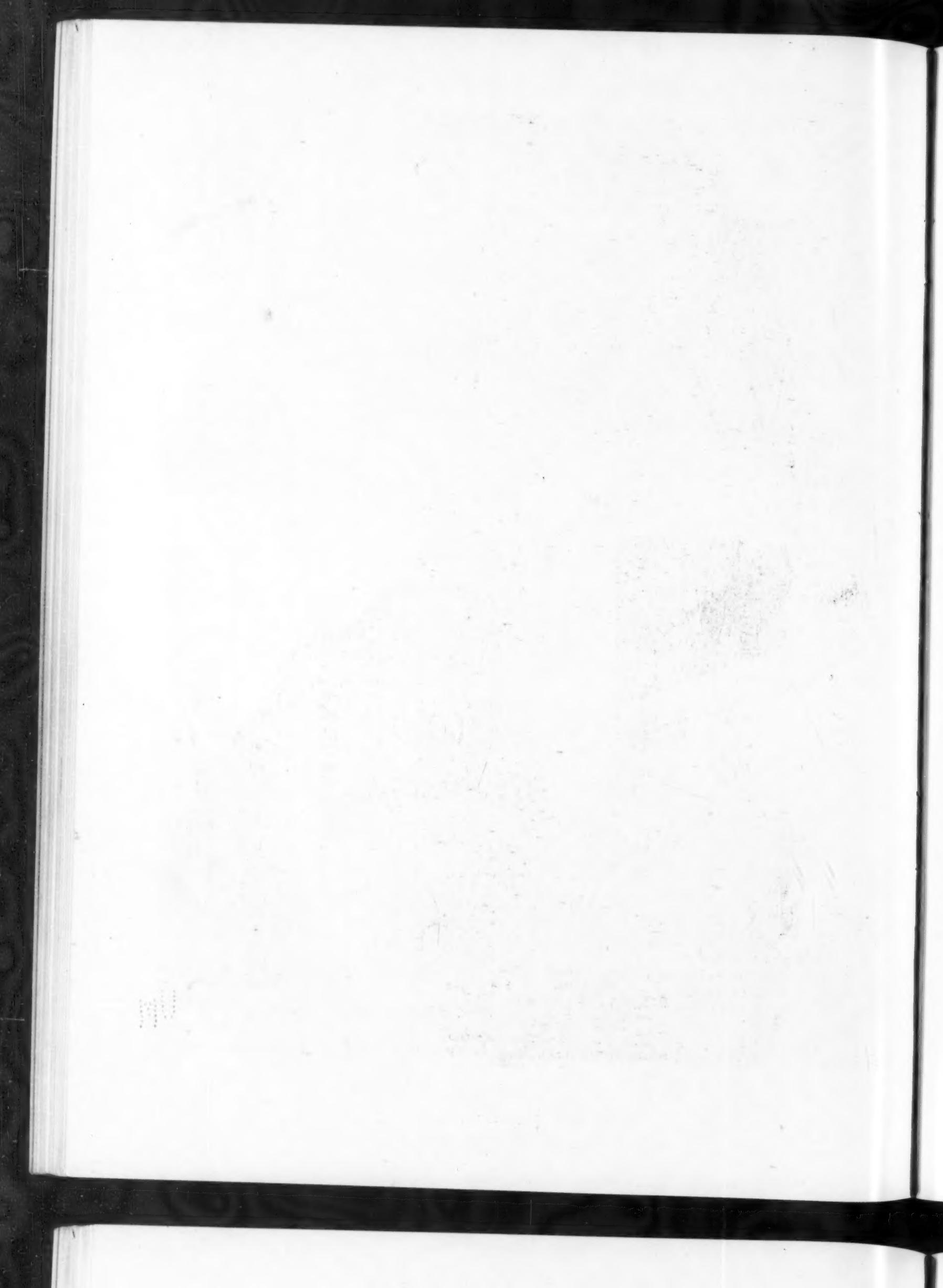
1973-10-12 2417

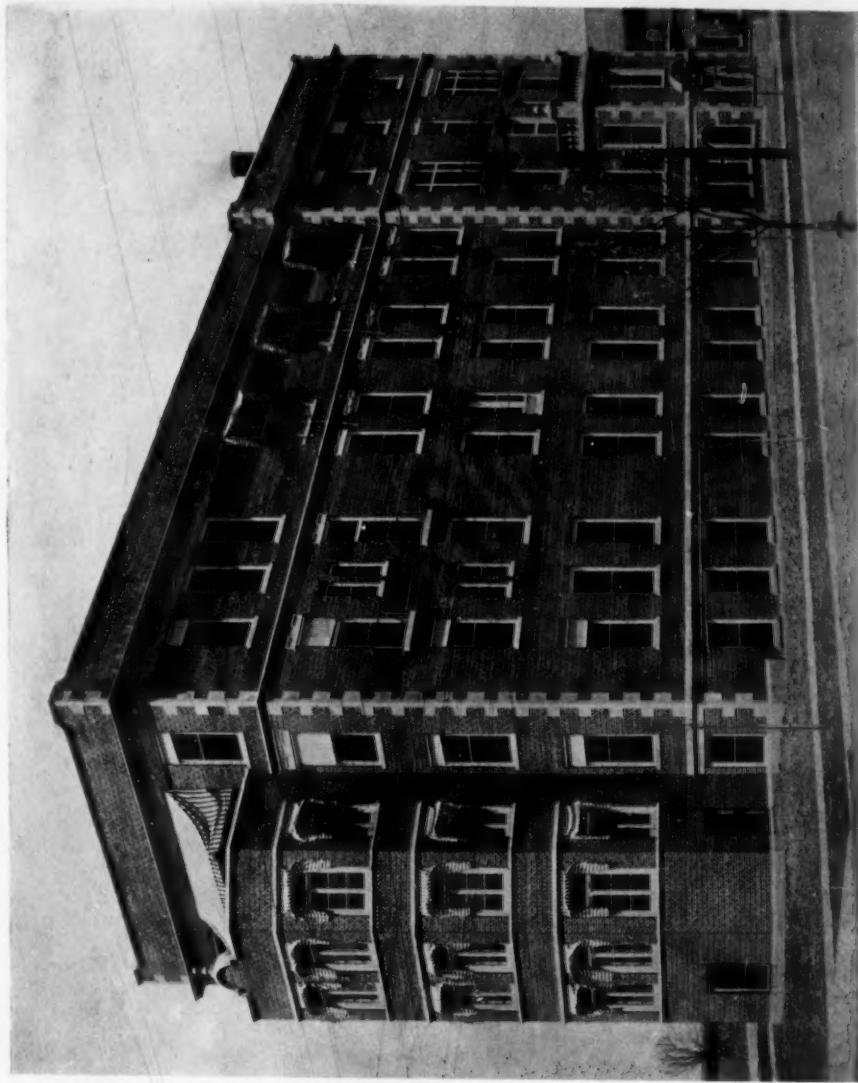


GENERAL VIEW OF ENTRANCE COURT

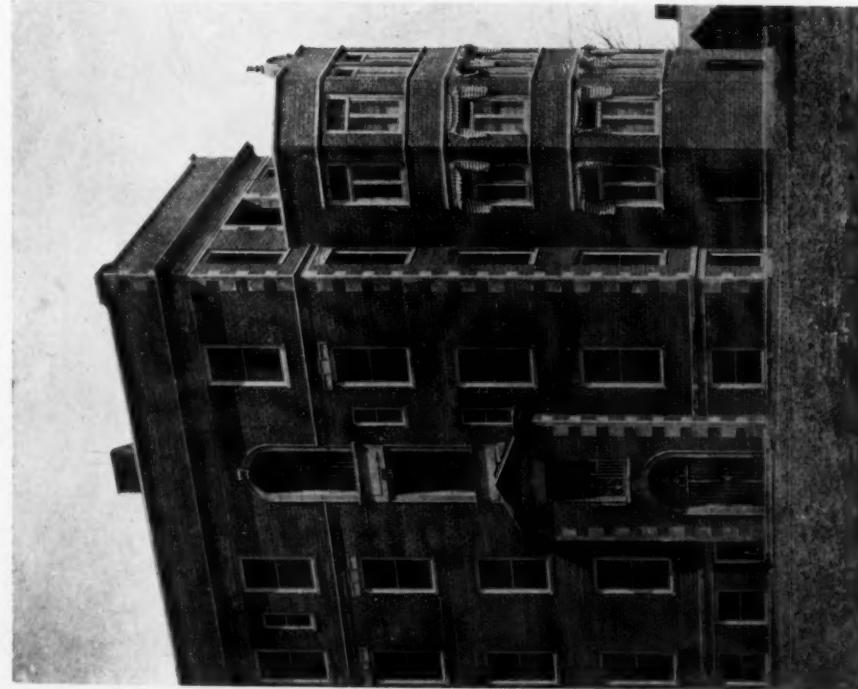


PLAN AND DETAIL OF WARD PAVILION  
BROOKLYN HOSPITAL, BROOKLYN, NEW YORK  
LORD & HEWLETT, ARCHITECTS

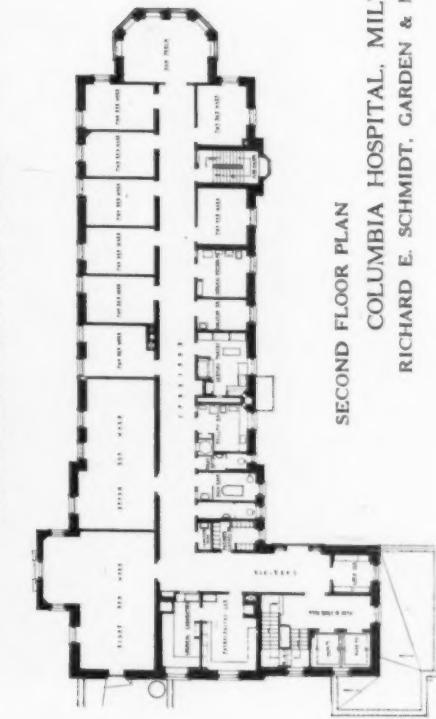




## GENERAL VIEW OF ENTRANCE FRONT



## VIEW SHOWING OPEN FIRE STAIRS

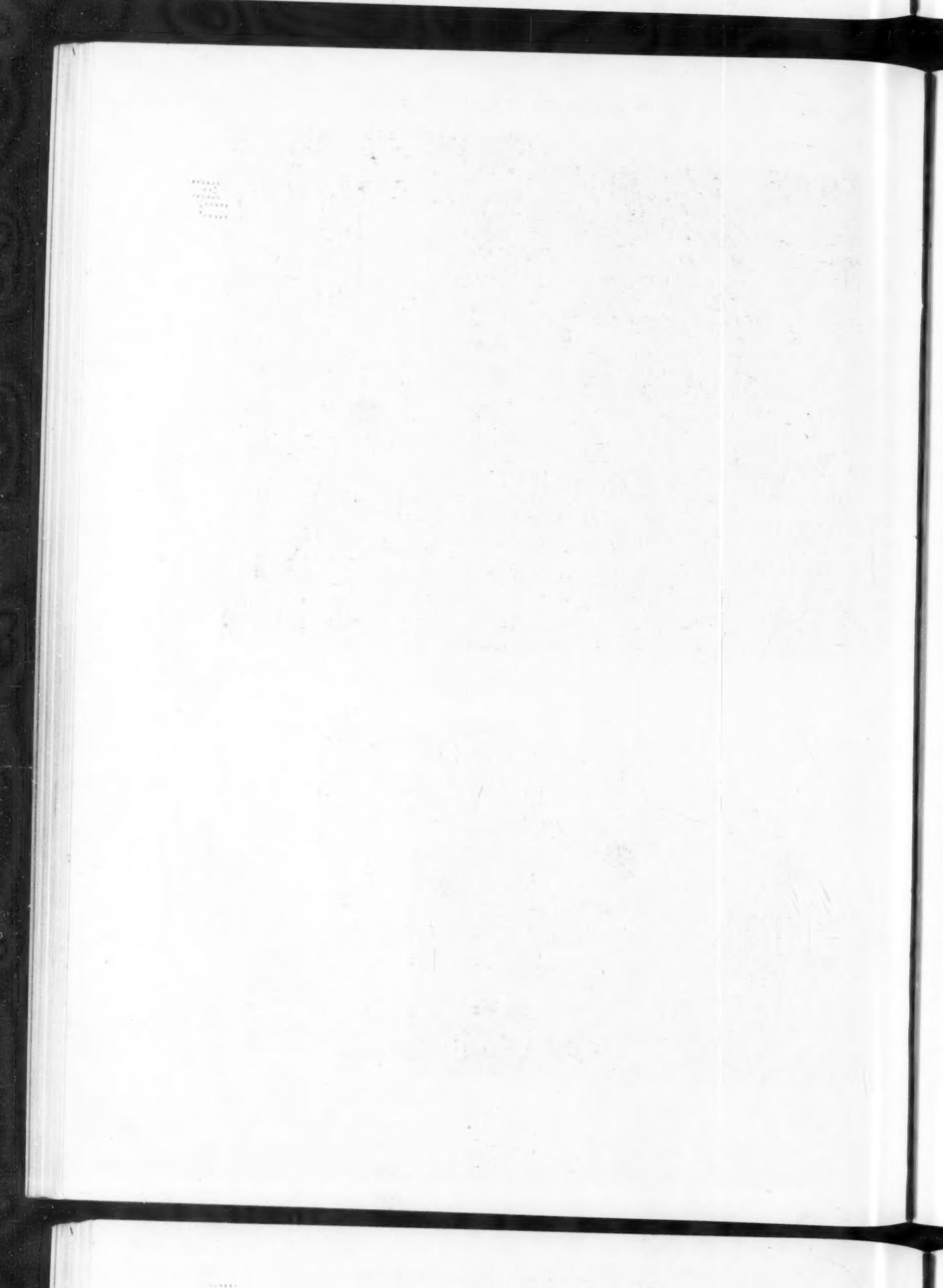


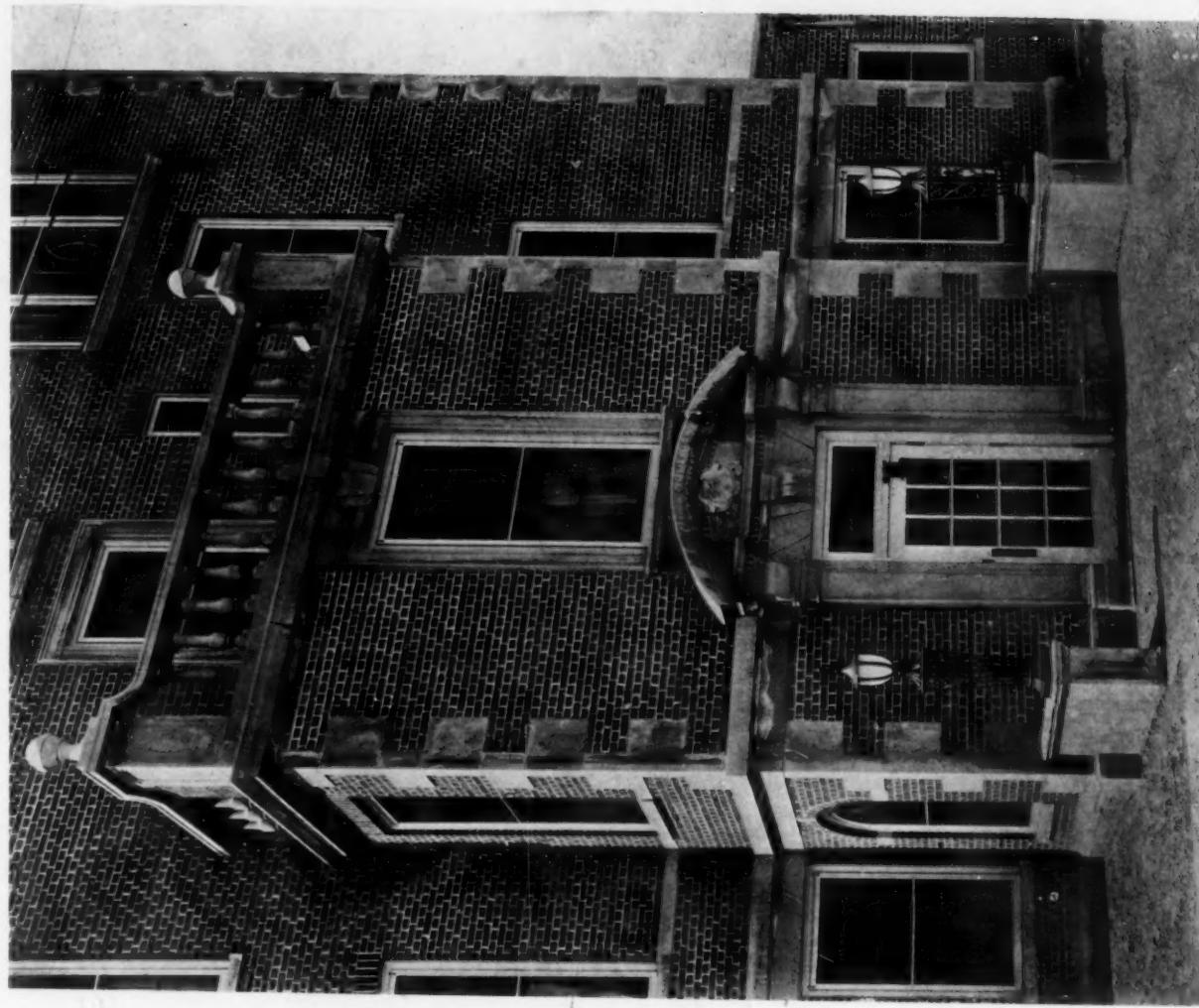
SECOND EDITION PLAN

COLUMBIA HOSPITAL, MILWAUKEE, WIS.  
RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS



## FIRST FLOOR PLAN

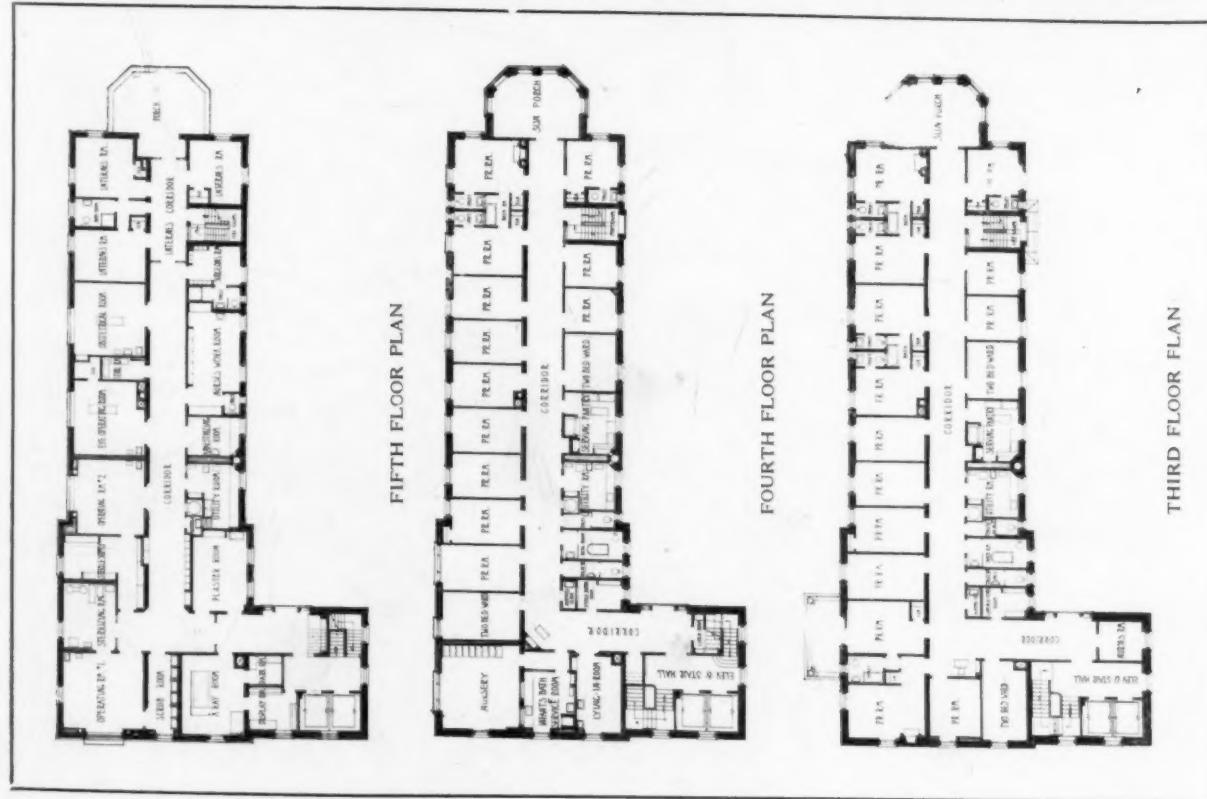




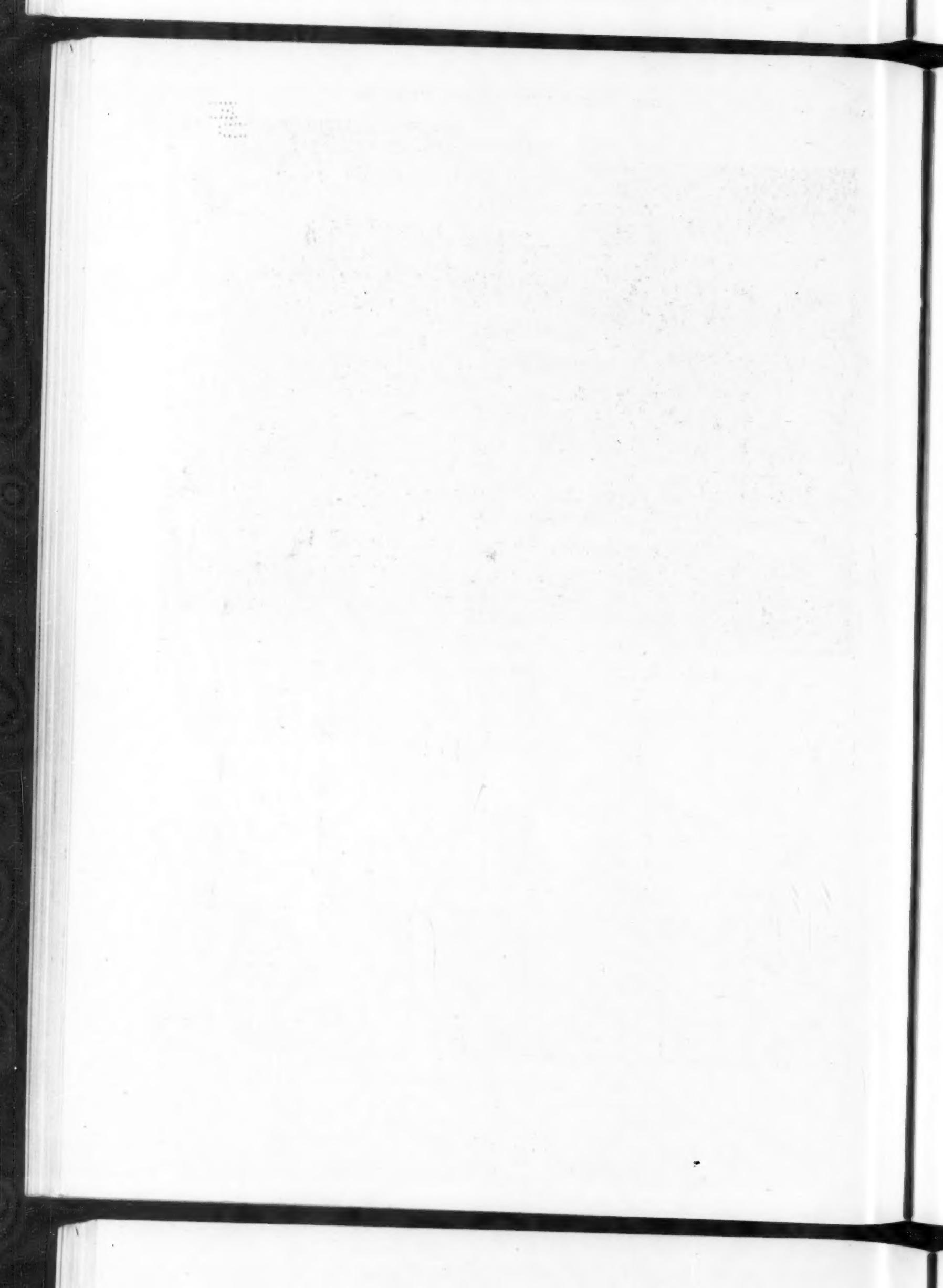
## DETAIL OF MAIN ENTRANCE

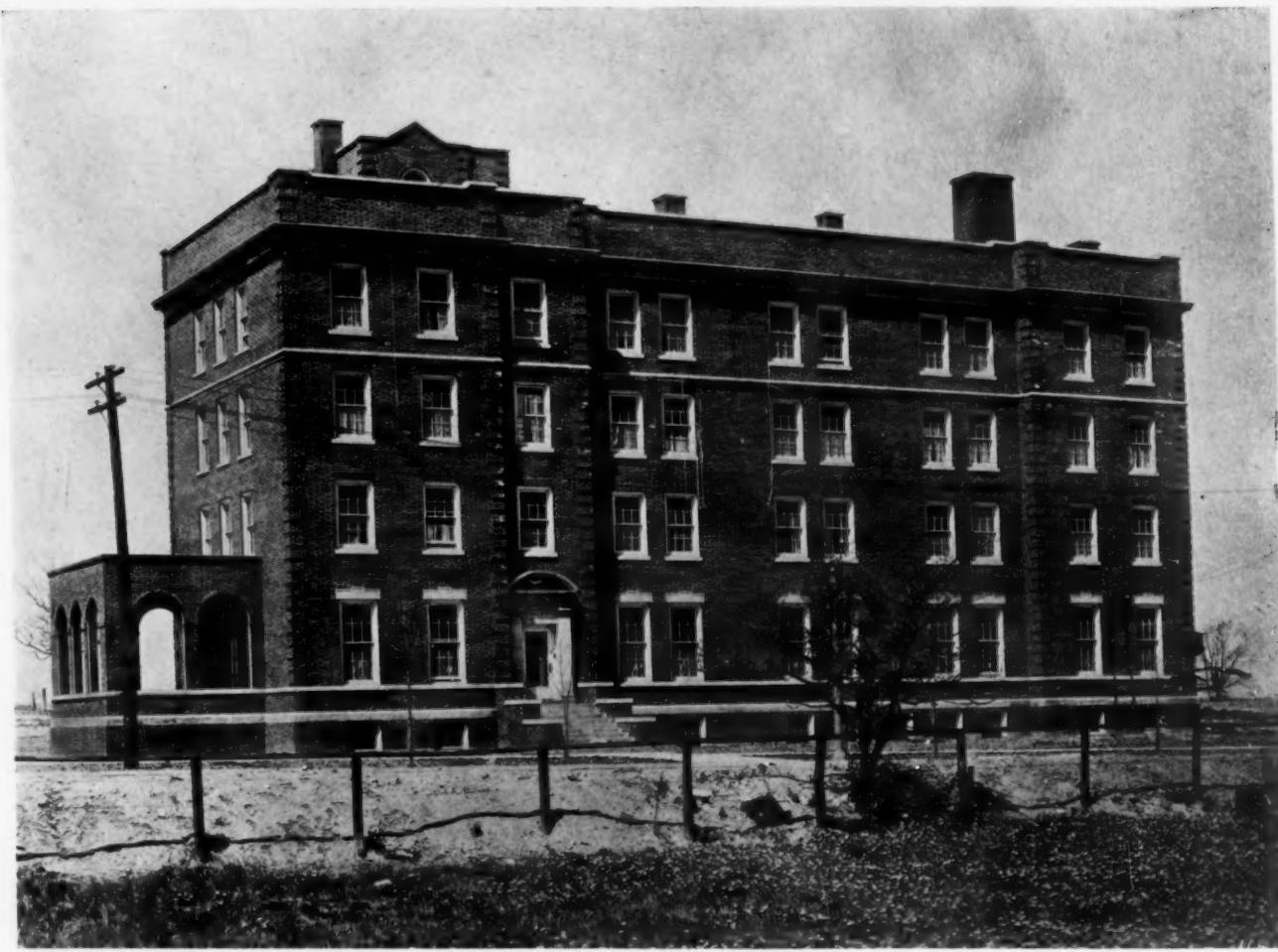
**COLUMBIA HOSPITAL. MILWAUKEE, WIS.  
RICHARD E. SCHMIDT, GARDEN & MARTIN, ARCHITECTS**

RICHARD E. SCHMIDT GARDEN & MARTIN ARCHITECTS

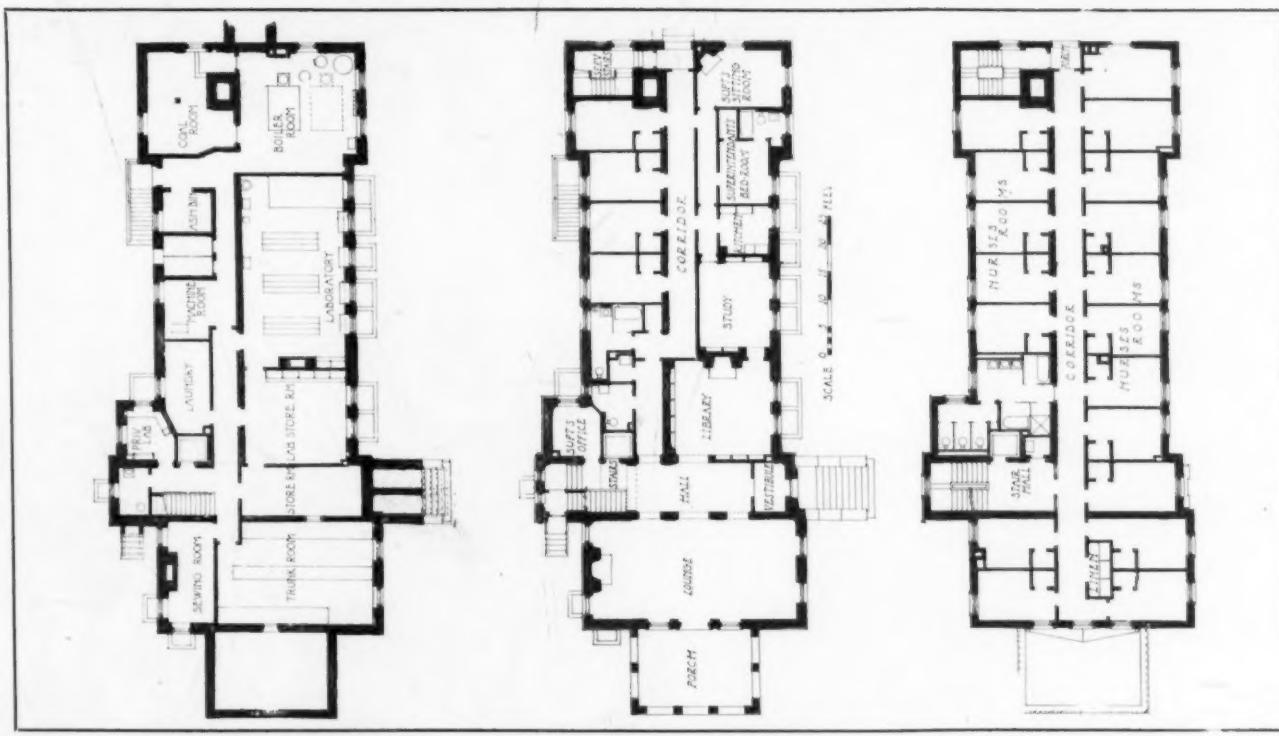


FIFTH FLOOR PLAN





GENERAL VIEW OF ENTRANCE FRONT



BASEMENT FLOOR PLAN

FIRST FLOOR PLAN

TYPICAL FLOOR PLAN

NURSES' HOME, COLUMBIA HOSPITAL, MILWAUKEE, WIS.

SCHUCHARDT &amp; JUDELL, ARCHITECTS



## Description of Hospitals Illustrated in the Plates

NORFOLK COUNTY TUBERCULOSIS HOSPITAL, BRAINTREE, MASS. PLATES 86-89. This is one of the first tuberculosis hospitals to be erected in Massachusetts under the recent State law which superseded an earlier one directing each city of more than ten thousand population to erect and maintain a hospital, and made the counties responsible for erecting the buildings, the cost of the service to be charged proportionally to the cities and towns. This centralizes the work of caring for sufferers from the disease and enables more economical administration to be effected. In this State the incipient cases are cared for in the State sanatoriums, so the county buildings are equipped to treat moderately advanced and advanced cases. Where municipal hospitals exist, terminal cases are treated locally.

The Norfolk County Hospital is designed for both moderately advanced and terminal cases. The accommodations in wards and rooms total seventy-five beds and in an emergency one hundred patients could be cared for. The building is of the pavilion type of plan and is composed of twenty units arranged with easy access from one to the other but separated by masonry walls and fire-doors. All the wards and private rooms are on the first floor so that the nursing is greatly simplified. The plan is divided into three main divisions, the administration portion, with offices and nurses' and employees' quarters; the service portion, with kitchen, storage and dining rooms for patients and staff; and the nursing portion which is supervised from two octagonal centers, the wards and private rooms radiating from them. These central nurses' stations enable efficient service to be given by a small number of nurses. The terminal cases are taken care of in private rooms and a separate corridor serving them eliminates the noise of traffic in the main corridor. Every patient can be accommodated on the porches, doors without thresholds leading to the terraces from all rooms and wards. Dormer window lighting is used in all rooms and wards where covered porches occur, so that the lighting of the interior is not sacrificed. The general exposure is to the south, and the plan is so arranged that all wards and rooms have either an east, south or west outlook.

An operating room is provided and adjoining it a sterilizing room and a laboratory. There is also an examination room and contagious ward with separate service, and isolated from the remainder of the hospital.

The kitchen is on the ground floor and well ventilated. The service is through a serving room to the patients' central dining room, which is operated on the cafeteria principle. The staff and employees' dining rooms are in groups at either side of the kitchen, and beyond them in a separate unit, are large store-

rooms and a fireproof garage for five cars. Meals for patients confined to bed are served from the diet kitchens in connection with each ward. These rooms are fully equipped with warming devices, sinks, cupboards and refrigerators, the latter supplied with brine from the central ice plant in the basement which is capable of making four tons of ice daily. All the cooking is done by gas or electricity.

Special attention was given to the details of the lighting system. The corridors are equipped with double acting semi-indirect fixtures, white lights being used for the evening and blue for night lights, the bowl being so adjusted that all rays of light strike above the door transoms. In the wards and patients' private rooms, green shaded inverted fixtures protect the patients from glare, and at night the wards are lighted by blue lights set in the floor. The electric silent call system for nurses is installed with provision for immediate service because the signal light can only be released at the patient's bedside. The operating room is lighted from concealed bulbs and reflectors so that the illumination is uniform and no shadows interfere with the surgeon's work.

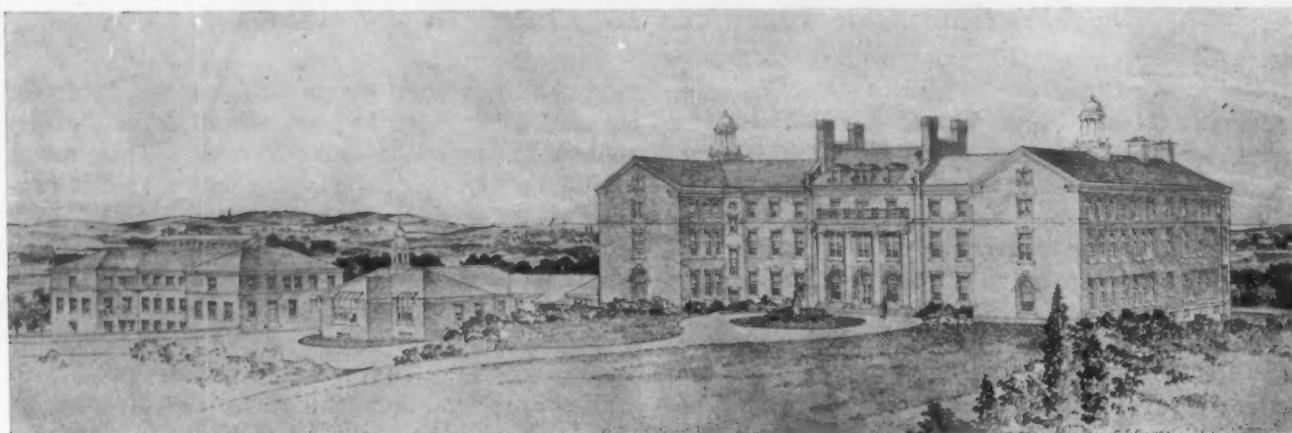
An effort has been made to create a cheerful, home-like character in the architectural treatment, to offset any semblance of the institutional in the mind of the patient, for the tubercular patient is easily influenced by his surroundings, and contentment of mind is a factor that cannot be overlooked.

CAMBRIDGE TUBERCULOSIS HOSPITAL, CAMBRIDGE, MASS. PLATE 90. This building is designed for the treatment of the city's advanced cases of pulmonary tuberculosis, the patients being accommodated in general wards and private rooms. It contains also the administration offices for the general hospital detail and the supervision of a number of open dormitories located at the rear of the property and used for the treatment of incipient cases.

The preparation of food for patients and employees and the laundry work connected with the institution are done on the first floor. The domestic help is quartered in the third floor of the central building, these rooms being lighted by windows on the sides and rear of the high parapet.

The wards in each of the wings are arranged with diet kitchens. Open-air terraces in addition to the sun rooms provide space for bringing all the beds on the first floor into the open air if desirable and doors throughout the building are sufficiently wide to make the removal of beds easy. The building is heated by steam, and natural ventilation is depended upon in all the rooms because of the building's high location and separation from other buildings.

The exterior is constructed of water struck brick and trimmed with concrete stone. The interior is finished in brown ash with painted plaster walls.

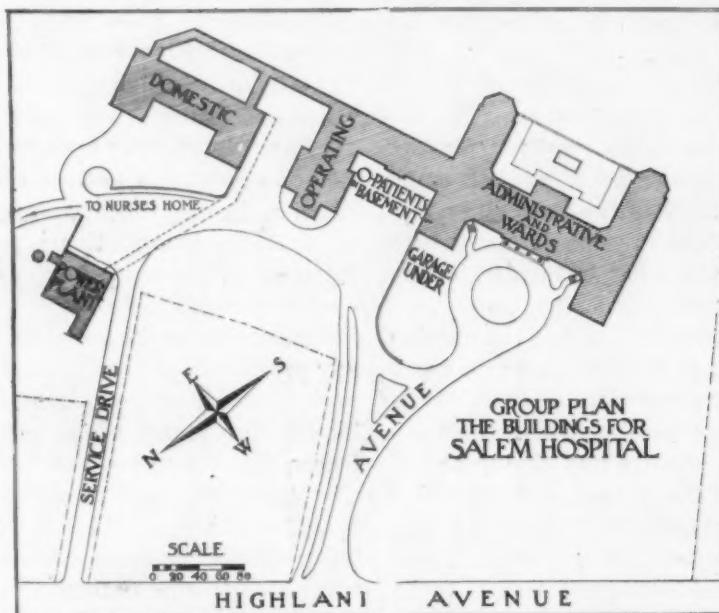


Perspective View From the West Showing Relation of Buildings in Salem Hospital Group

Haven &amp; Hoyt, Architects

The floors are of wood covered with battleship linoleum. The exterior metal finish is of copper. The total cost in 1915, including the elevator and all the equipment with the exception of furniture, was approximately \$80,000.

**SALEM HOSPITAL,** SALEM, MASS., PLATE 93. The new General Hospital at Salem, Mass., is located about one mile from the center of the city on a tract approximately twenty-five acres in extent, on high ground commanding extended vistas. Peculiar conditions of the site, at first formidable, were found to have particular advantages; because of them the minor buildings were enabled to be placed below the level of the main hospital and subordinated so that they do not interfere with the fine view of the harbor to the east. The main floor of the operating building is at the level of the basement of the main hospital and the serving room in the second story of the domestic service building is also at this same grade. This facilitates the removal of patients to and from the operating building and the distribution of food through the corridors connecting at this level, and furthermore, confines all noise and confusion incident to this service to the basement level of the main building, where it causes no annoyance to the administration or patients. An automobile shelter accessible from the lower grade at the east of the main hospital building is so concealed under the front lawn as not to betray its presence from the main approach.



The driveway to the service building and the power plant is also removed from the main building and because of the high elevation of the latter, dust and street noises, smoke from the boilers and odors of cooking, are carried away by the generally prevailing winds from the south and west. The power plant with its underground coal pocket is inconspicuously located on lower ground permitting connection with the main group by a tunnel which also affords facilities for the passage of pipes and wires, rendering them accessible at all times.

Land has been reserved for future growth in the direction of the main thoroughfare to the north, and sites are available for expansion to the south of the connecting corridor sufficient for the distant future. The buildings have been so planned that the power plant and all domestic departments can be readily expanded.

The hospital building faces east of south in order to insure the maximum amount of sunlight on all facades during the greater portion of the year. In conformity with recent tendencies in hospital planning, open-air terraces and balconies are arranged on three sides of the open south court and their favorable position makes them of use throughout the year. They have been carefully devised to interfere as little as possible with the daylighting of the adjoining rooms and are set back as they rise so that direct sunlight, in addition to shelter, may be had on each. This building has a frontage of 185 feet, the east and west

wings are 145 feet deep, and the open court is approximately 60 by 115 feet. All the buildings in the group are of fireproof construction, water-struck red brick being used for the walls and slate for the roofs. There are accommodations for 20 private patients occupying single rooms, 44 semi-private patients in small wards, 20 male ward beds, 20 female ward beds, 19 maternity cases and 11 children's cases, making a total of 134 beds. Rooms are provided in the attic story for the temporary accommodation of nurses, but at such time as the future nurses' home, already designed, is built this space will be available for the internes' quarters, additional patients and other uses.

In the basement is located the out-patient department, the pharmacy, mattress and clothing sterilizing rooms, rooms for the care of ward patients' clothing, the X-ray department, the pathological laboratory, plaster room and space for hydrotherapeutic and zander departments.

The hospital is a combination of the block and pavilion type of plan. The separate buildings provide accommodations for those departments that generally cause annoyance to patients if contained in the same building with the wards, and the block plan of the main building insures the necessary shelter for the open court that the exposed position of the building demands.

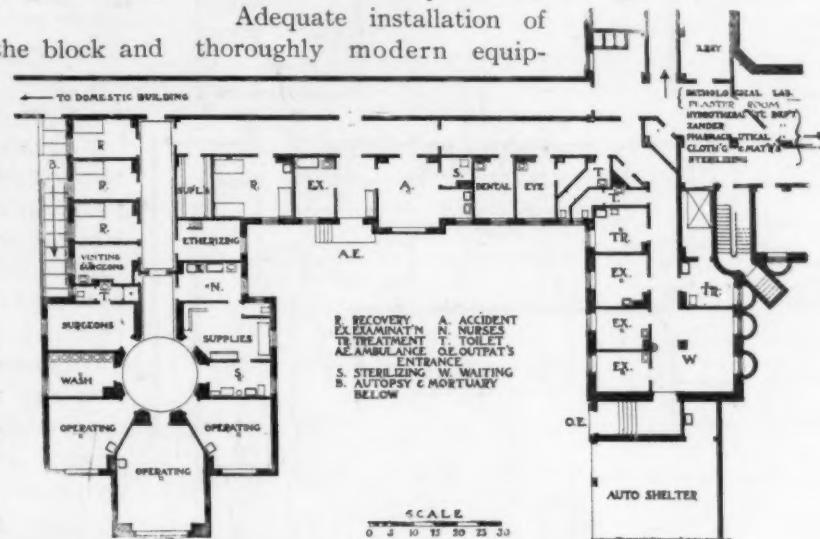
The operating building shows a successful carrying out of a deliberate architectural scheme, as regards arrangement and convenience, seldom seen in hospital planning.

The service building contains, in addition to the working departments, dining rooms for nurses, house officers

and domestics, together with dormitories for both men and women employees. Supplies are received and cared for at the ground level on the second floor and may readily be sent to the kitchen floor above by means of the elevator. The food may be returned to the serving room on the second floor, placed in steam tables until served, or placed directly in heated food carts and distributed by means of the dumb waiters, starting from the basement of the main building to the various diet kitchens where steam tables are provided for its care.

The heating and ventilating system was purposely designed to be simple in its operation. Direct radiation is used generally; ventilation is provided in the open wards, the operating unit, maternity department and nurseries. The high location of the hospital makes ventilation by open windows in other rooms a practical and satisfactory method.

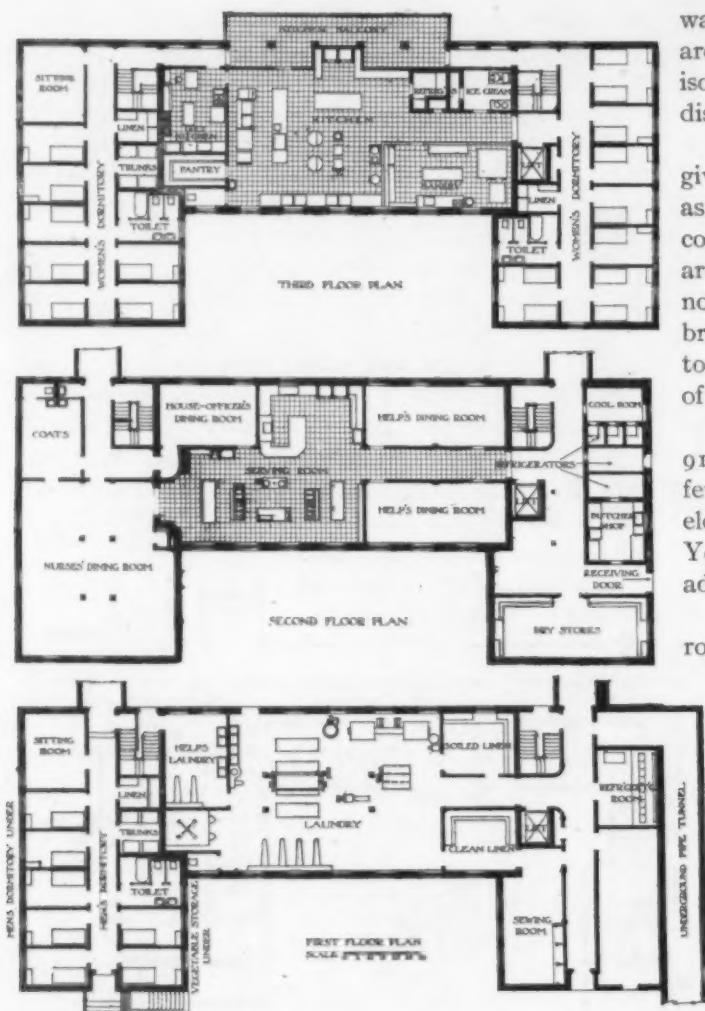
Adequate installation of thoroughly modern equip-



## Floor Plan of Operating Building



## General View of Operating and Domestic Service Buildings of Salem Hospital Haven & Hoyt, Architects



Floor Plans of Domestic Service Building, Salem Hospital

ment has been made throughout. Electric light call systems for doctors and nurses are used. Electric elevators of sufficient size to accommodate patients' beds are of the automatic type, thereby doing away with operators. Floors are generally of linoleum, tile or terrazzo with masonry bases. The doors throughout the hospital are of sufficient width to permit the moving of patients in their beds. Each ward has its separate service room, diet kitchen, convalescents' dining room, toilets, bathrooms, blanket and linen warming room and medicine closet. In the surgical

wards and in connection with the private wards, there are rooms assigned for surgical dressings and in the isolation wards there are facilities for sterilizing all dishes used by patients.

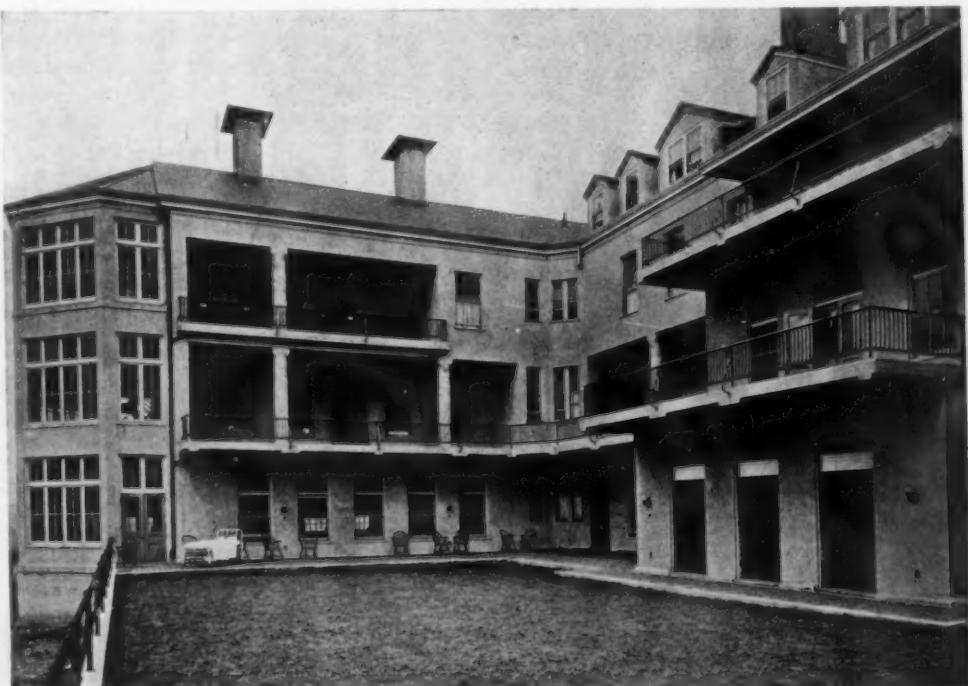
In the work of designing the hospital, attention was given to the suggestions from the hospital staff as well as the trustees. During the progress of the drawings, consultations and meetings were arranged with the architects. In this way all suggestions were carefully noted and discussed and much valuable data was brought to bear in developing the plan, and the result to those involved is an extremely satisfactory solution of the problem of the Salem Hospital.

**BROOKLYN HOSPITAL, BROOKLYN, N. Y. PLATES 91, 92.** Brooklyn's oldest hospital has during the past few years been completely rebuilt on the old site, an elevation overlooking the city and harbor of New York, close to the business section of Brooklyn, and adjoining and forming a part of Fort Green Park.

There are 289 beds apportioned as follows: Private rooms, 38; private (four bed) wards, 54; public, 191; isolation, 6.

The work of the hospital is carried on in a number of buildings, each devoted to particular purposes and connected by corridors to insure efficient service. Large courts are provided for ample light and ventilation. A list of the different buildings together with a brief description of their sub-divisions follows:

**Administration Building.** This forms a central unit and contains in the basement the X-ray department and on the ground floor the main offices. On the second floor the maternity wards are located, extending into the north pavilion



Detail View of South Court, Showing Airing Balconies, Salem Hospital, Salem, Mass.  
Haven & Hoyt, Architects

where the delivery rooms are arranged. The third floor contains private obstetrical rooms and wards, and the fourth floor contains sleeping quarters for female heads of departments.

*The North Pavilion*, directly adjoining the administration quarters, contains in the basement the drug room, storage rooms and general lecture room and on the first floor, offices in connection with the main administration. The operating suite is located on the third floor and the fourth and fifth floors are given over to internes' quarters.

*The East Pavilion* on the first floor contains private wards for women and private rooms connected with open-air balconies on each of the other floors with a large solarium on the roof.

*The West Pavilion* contains ambulance and service entrances in the basement, the southern end being given over to emergency wards and treatment rooms, while the northern end contains the kitchen and helps' dining rooms. The first floor contains the dining rooms for doctors and staff in the northern part, and private wards for men in the southern end. The second and third floors are given over to surgical and medical wards for women

and men respectively and the fourth floor to children.

*The Nurses' Home* contains in the second, third and fourth floors, single rooms for pupil nurses. The basement has a lecture room, diet classrooms, small laundry for individual use and trunk room. The first floor, in addition to the library and reception rooms, has quarters for officers of the training school. The access to the dining room in the west pavilion is had by a covered corridor leading from the nurses' home.

*The Power Building* is in the northeast corner of the property and contains in the basement, boiler and engine rooms, refrigerator plant, ice plant, vacuum cleaning machinery, water filters and generators. The first floor is given over to the laundry and the second and third floors provide quarters for male and female help respectively, each person being assigned a single room.

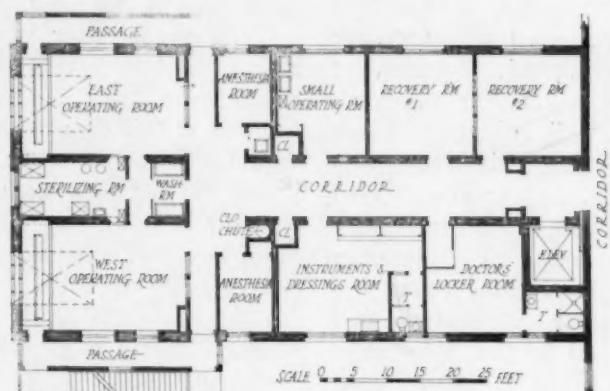
*The Pathological Department* is contained in a two-story building located between the power plant and the north end of the west pavilion.

The floors in the wards and private rooms are of terrazzo, the joints arranged to come over beams. Countersunk linoleum is used in the centers of the large wards. Dormitory floors of the nurses' home and all of the helps' quarters, laundry and service departments are of cement. Six-inch-square red tile is used for the floors of the main kitchen and diet kitchens and gray tile for the floors and walls of the operating rooms. All wards and private room floors are supplied with blanket warmers, and the duty rooms with ventilated closets for utensils. The examining sinks have elbow control for the faucets. The silent call system is installed for nurses and the megaphone system for calling doctors. Floor lights are used in the wards for night lighting. They are built in the floor construction to the depth of about 10 inches and are 11 inches in diameter, 8 inches of which is glass, the sides are painted white and a 10-candle power bulb gives sufficient light for the nurses without disturbing the patients.

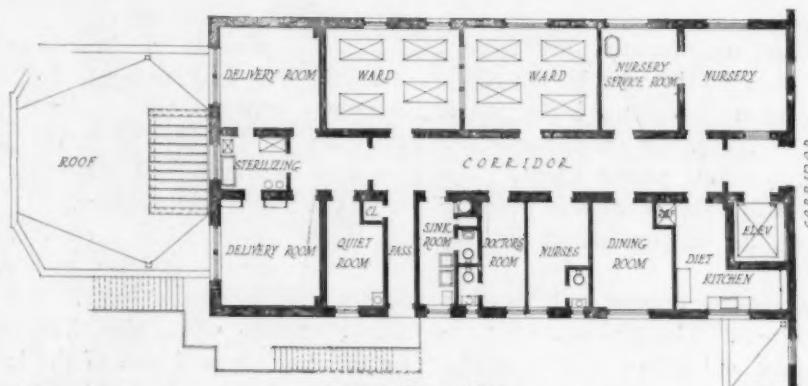
Sufficient balcony and solarium space is provided to enable every patient to be moved out of doors if desired.

The dispensary for out-patients is located on the west boundary of the property with a separate entrance direct from the street so that its operation is carried on independently of the hospital work.

COLUMBIA HOSPITAL, MILWAUKEE, WIS. PLATES 94-96. The ideal of the trustees, the staff, the nursing body and the personnel of Columbia Hospital was perfection of service in their new buildings. This was the mainspring, but the balance wheel was a practical conception of the relative significance of mere building compared with skill in diagnosis and treatment by the personnel and staff. The present group is the successor of an earlier institution, as usual outgrown. The hospital was started in June, 1917, and occupied in December, 1918. The courage shown by the



Third Floor Plan, Showing Operating Suite



Maternity Section in North Pavilion, Brooklyn Hospital, Brooklyn, N. Y.  
Lord & Hewlett, Architects

trustees in starting at that time has been amply justified. The building illustrated is the first unit of a much larger group. This accounts for many otherwise unexplainable points in the plan, most of which will be obvious, however, on comparing the plans of the first unit with the group plan shown on page 161. The exterior is of a sand mould vari-toned red brick laid with a white joint and trimmed with buff Bedford stone. All interior floors and bases are of terrazzo except in the lobby. The door trim throughout is of rolled steel and set flush with the plaster. The plumbing fixtures are of porcelain. Two elevators are installed, one with push button control; the other, car switch. The dumb waiter is electrically operated, with full automatic control. All refrigerators are cooled by means of a carbon-dioxide refrigerator plant, and ice is made for hospital uses. All water is filtered and drinking water cooled. There is a central water sterilizing plant in the power house, which supplies sterile water to utility rooms, etc., and a water distilling apparatus in the penthouse with water piped to the operating room floor and to the laboratory. An electro cardiograph is installed in the ground floor with outlets on the patients' floor. The X-ray department and operating departments are unusually large for hospitals of this size.

In the enlarged scheme the operating department will move to the fifth floor of the new building, the present operating department becoming birth rooms. The laboratory will move into larger quarters, as will also the kitchen, laundry and power plant. The present main entrance will become a side entrance either for ward visitors, for employees, or for the dispensary.

The patient capacity is 67, internes 3, help 16, a total bed capacity of 86 beds. The cost was approximately \$211,031 and the cubic-foot cost \$.3783. These figures are exclusive of architects' fees but include lighting fixtures, hardware and refrigerators.

**THE FAULKNER HOSPITAL**, a new addition to which is illustrated on page 172, is typical of the manner in which hospitals find expansion necessary as the community which they serve increases in population. This hospital, erected about fifteen years ago by the late Dr. and Mrs. George Faulkner in Jamaica Plain, a suburb of Boston, had in addition to its community work gained a considerable degree of popularity as a private hospital, and in keeping with the growing tendency there developed an increasing demand for treatment of maternity cases. Consequently when

the trustees were called upon to consider the extension of the facilities for the care of patients, it was decided to erect a new ward building to be devoted entirely to maternity cases.

The building has been so planned that the patients' rooms receive a southerly and westerly exposure, while the workrooms are at the rear toward the northwest. On the first floor in addition to a private suite, are two open wards of four beds each, it being undesirable to have a large number of beds in a single open ward of this class.

The second floor is devoted entirely to private rooms, while the third story contains the delivery rooms with their auxiliary accommodations. The location of this department could not be bettered as, with its noises, it is entirely disassociated from and above the patients' quarters, yet easily reached by elevator connection. The floors are rendered sound proof by use of cork insulation, as are also the walls enclosing the nurseries.

The two main floors are each provided with diet kitchens, nurses' workroom, linen closet, toilet accommodation, and a nursery with its service room. A nurse's station is centrally located off the main corridor and the building is equipped with a nurses' electric light call system.

A bay window in the nursery admits a certain amount of actual sunlight, and a projection off the nurses' workroom having outer and inner windows provides for the care of flowers at night, making it possible to admit fresh outer air and isolate flowers from the inside temperature.

In the basement, of necessity, a considerable portion of the area is assigned to housing the domestics, and a diet kitchen primarily for instruction in the nurses' training school also offers excellent opportunity for sterilization and care of the baby milk bottles.

The building is entirely of fireproof construction. Floors in general are of linoleum with masonry bases, except that terrazzo is used throughout the workrooms including the delivery section of the building. The exterior is of eastern, water-struck brick with concrete stone trimmings, and designed in the spirit of the original group.

While this building is designed and thoroughly equipped in the most modern manner for the exclusive use of the intended class of patients, it has been so planned that it is perfectly possible to assign the rooms if opportunity existed, and necessity demanded, to any class of patients that the hospital might admit.

## Hospital Design: The Relation of Initial Cost to the Expense of Operation and Maintenance

By LINDLEY MURRAY FRANKLIN

THE initial cost of a building is tangible, easily demonstrated and felt at once, while the cost of maintenance is intangible, difficult to fix and continues during the life of the building. It is obvious that it is economy to spend a certain sum in first cost, once for all, if thereby the interest on this amount can be saved in repairs or labor of administration. As it is so easy to reduce the total estimates for construction and equipment, and as it requires the most thorough knowledge and the most conscientious investigation of the conditions to determine the items which go to make up the cost of maintenance, a proper balance between these two elements is rarely studied and almost never arrived at.

Unfortunately the work of financing the building of a hospital is started before the essential facts are thoroughly understood by those interested in the project. People are naturally so keenly alive to the necessity of caring for the sick and injured in their community, that a campaign to raise a certain sum (fixed by the committee without adequate advice) for a new building is carried on with enthusiasm and is generally successful. A site is frequently purchased before even preliminary plans and an approximate estimate have been obtained.

The requirements of the institution are then carefully studied and an architect appointed who is asked to design a building which shall embody all essential features and any others that he may deem advisable, but the cost is not to exceed the sum raised in the campaign. What usually happens in such cases is that the cost of the building, if built according to the final plans, far exceeds the available funds, and, as the committee is not willing to reduce the size of the building, it is built as cheaply as possible.

How much better it would be to reverse the process. First study the requirements, then obtain the approximate cost, adding fifteen per cent for contingencies, and then proceed with the campaign to raise not only this sum but also an additional amount for an endowment, as the new building is always more expensive to operate on account of being larger than the old one and entailing better treatment of patients.

As it is a fact that people contribute generously toward a building fund but hesitate to subscribe to repairs and general running expenses, should not a hospital be designed and built primarily with the idea of keeping the cost of administration down to a minimum, even if the initial cost is somewhat higher? The interest on the increased cost will be much less than the additional running expense of a poorly designed, cheaply constructed and inadequately equipped building, and this additional expense for maintenance is a factor which increases each year.

If economy of administration is paramount to every other consideration, it is essential that the hospital should be designed to embody only those features which are necessary to the welfare of the institution and no others. This is a difficult thing to do, but it may be accomplished if those who are responsible for the building regard each suggestion and every requirement as a new problem applied to the specific case. Serious errors are made when the requirements are stated merely as modifications of an existing organization and plant instead of basing them on a fresh study of the actual functions necessary to obtain the desired results. A new building provides an opportunity to improve the whole procedure of the hospital, impossible under the old conditions.

To do this the architect must study in detail the organization of the institution; he should know the several duties of the employees, staff, nurses and attending doctors, and he should be familiar with the service, housekeeping and the treatment and care of the different classes of patients. In addition he must take into consideration the changes and growth in administration which are bound to occur when the institution is housed in new surroundings.

There is very little to criticize in the rooms for patients in our modern hospitals, but how frequently we see these buildings designed with utter disregard to the work of the staff, nurses and employees. As the time of the attending and house staff is limited, it is essential that the dispensary, patients' rooms, operating rooms, etc., should be so located that the maximum number of patients may be visited and treated in the shortest time; otherwise, the staff will have to be increased or the patients will suffer. The proximity of the wards to each other, so that at times one nurse may supervise more than one ward; the proper location of toilets, utility and workrooms, and a well laid out kitchen and laundry all tend to efficient service, and that means fewer employees.

All hospital buildings should be built as nearly fireproof as possible, not only on account of the safety of the inmates, but because this type is far more enduring and will require fewer repairs than any other. The additional cost is a good investment.

It is not intended, at this time, to discuss the many details of construction, although it may be said that "hospital construction" has been carried to an excess in many instances. Surely there is no excuse for increasing the cost by designing the nurses' quarters with plaster coves at all re-entrant angles, sanitary base and tile floors, or by covering the walls of the operating rooms with marble or tile unless the repairs and the labor of cleaning will thereby be reduced considerably. An eminent surgeon has stated

that he has performed critical operations in dirty tenement rooms with perfect success and with no fear of infection, as he knew his patient, assistants, and utensils were sterile. It seems far more logical to confine the tile wainscot to such rooms as toilets, pantries, kitchens and "plaster-rooms" where the work is of such nature that walls require constant scrubbing.

When we know the importance of hospital equipment it is surprising how frequently the consideration of this question is postponed until the construction is well along, resulting in some of the most glaring and

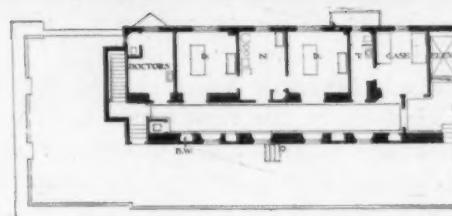
expensive faults of our modern institutions. At the time the preliminary drawings are being studied, every piece of built-in and movable furniture should be carefully considered with a view to the need it is to serve in each specific case and in regard to the cost of operation. If this were done conscientiously vast amounts in the initial cost of the building would be saved and we would not so frequently see apparatus standing idle in the utility rooms, kitchen and pantries which requires almost as much attention as that in constant use.

MATERNITY WING, FAULKNER HOSPITAL, JAMAICA PLAIN, MASS.

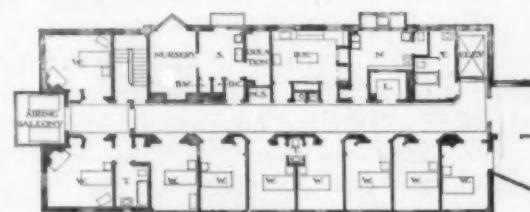
## HAVEN & HOYT, ARCHITECTS



**T**HE plans reproduced here show a special hospital unit devoted to maternity cases only. An innovation and distinct economy of space will be noted particularly on the second floor where splayed door jambs to the wards permit a substantial reduction in the usual corridor width, although providing adequately for the moving of patients in beds—a desirable feature in view of the airing balcony accommodation provided at the westerly end for private suites, and between this building and the administration building for other patients. The thickness of wall needed for the splay affords closet space for rooms.



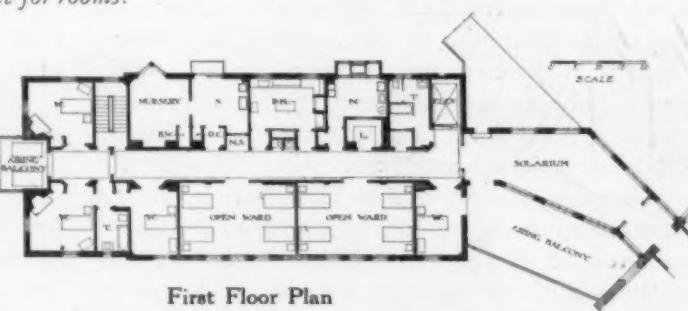
### Third Floor Plan



### **Second Floor Plan**

S. - Service  
D. K. Diet Kitchen

*N. S. Nurses' Station  
B. W. Blanket Warmer*



### First Floor Plan

*D. C. Drying Closet  
D. Delivery Room*

*N. Nurses  
in U.S.A.*

## Mechanical Equipment

By D. D. KIMBALL

*Past President American Society of Heating and Ventilating Engineers  
Member New York State Commission on Ventilation*

THE mechanical equipment of the hospital is one of its most important features, for upon the success or failure of the mechanical equipment largely depends the comfort of the occupants, convenience of the staff, and the general efficiency of the hospital. Moreover, the expense of operating and maintaining the mechanical equipment is usually one of the largest, if not the largest, single item in the cost of the conduct of the hospital.

Steam heating versus hot water heating is still discussed. Undoubtedly in the days when only the old gravity steam heating system was available, the hot water system was more satisfactory, and possibly more economical.

The hot water system is subject to the danger of freezing, is slow in heating and cooling off (the forced system being less objectionable in this respect), and it involves the risk of serious damage in the case of a break in the piping, as well as possibly a serious waste of water.

The claim advanced that a modulation of water temperature with the outside temperature may be had with the hot water system is less real and of less importance than represented. This advantage may be approximated in the vacuum or atmospheric steam systems, and with a material reduction in installation and operation costs. The installation costs of the best vacuum steam system will not equal the cost of a forced hot water system, and the latter system is the more complicated.

Direct radiation is generally advocated and used throughout the hospital building, with the possible exception of the operating room in the larger hospitals where there is little or no objection to the operation of a mechanical ventilating plant throughout the heating season.

The direct radiators should be of the hospital type, having a perfectly smooth surface, with sections spaced three inches on centers so that they may be readily cleaned. The radiators should be supported from the wall by means of heavy brackets, there being a space of not less than three inches, and preferably four inches, back of the radiator, and five inches from the bottom of the radiator to the floor. In such an installation the floor is left entirely free and dirt-collecting areas do not exist.

The type of boiler to be used in a hospital plant is entirely dependent upon the size of the institution and the space available. Too often, in small hospitals, use is made of sectional cast iron boilers for heating, with an auxiliary high pressure boiler, sometimes referred to as a steam generator, to provide steam for sterilizing and laundry purposes. Such an arrange-

ment is not to be commended, for it results in the operation of two or more fires at all times and one fire is sufficient for all purposes for the most of the year. Also, the small sectional boilers are not economical in operation. This arrangement results in a complication of piping and equipment. The object of this plan is usually to eliminate the need of a high-grade engineer, in the belief that a janitor can operate the sectional heating boilers and the steam generator. It is a small hospital indeed in which the employment of high-grade firemen will not result in a saving in fuel more than offsetting the increased amount of wages.

In larger hospitals the use of the horizontal fire tube or the fire-box boiler is to be recommended. Only in the largest of plants, that is, those requiring one thousand boiler horsepower, or over, may the use of the water tube boiler be advised, for the fire tube boiler is equally safe, economical and durable, and less expensive.

Automatic stokers may be used for two purposes. First, to eliminate smoke where soft coal may be used to advantage, and second, to save labor, which becomes possible only in plants of one thousand boiler horsepower or over.

Provision for the future growth of the hospital should be made to the extent of allowing space for the later installation of additional boilers, and the size of the main steam lines and of the auxiliary apparatus, heater, etc., should be determined with this factor in mind.

Recently more emphasis has been placed upon a study of the economical operation of hospital plants. But few hospital plants are equipped with devices enabling the determination of the economy of operation, and yet this is a very simple matter and very desirable.

The installation of coal weighing scales, set in the floor, with platform sixty inches long and forty-eight inches wide, will enable the weighing of the coal as fired to the boiler. In larger plants a more elaborate equipment is possible. In addition to the coal scales some device for measuring the feed water as fed to the boiler should be installed. This will make possible a simple calculation by means of which the number of pounds of water evaporated per pound of coal fired may be determined for each day. For a refinement of this determination the temperature of the water fed to the boiler may be either read systematically from a feed water thermometer, or better still, a recording thermometer may be used to record this temperature. The coal also may be analyzed to determine the heating value thereof, and then an

exact determination of the efficiency of the boiler plant may be had.

Where separate costs of the operation of the heating and ventilating plant, laundry, kitchen, sterilizing and electric plants are recorded the division of fuel costs has been arbitrarily made. The installation of steam flow meters would make possible an accurate determination of the cost of steam for each department and provide a means of preventing wastes.

To obtain the best results a plant log sheet should be used, upon which hourly readings should be recorded of the boilers in use, draft pressure, steam pressure, feed water temperature, outdoor temperature, weight of water fed to boilers, coal fired, ash removed, service rendered to the building, men on service in the boiler room, and supplies received and used. A running account of the coal may be included, this showing the coal on hand at the beginning of the day, that received during the day, the amount used during the day, the balance representing that remaining on hand. If an electric power plant is in use, corresponding records should be made of the operating details thereof.

A careful interpretation of the records thus obtained should bring about a marked economy in the operation of the plant. An instance may be cited of a two thousand horsepower boiler plant which, previous to the keeping of such records, had operated at fifty-one per cent efficiency. At the end of a year's use of apparatus and records as described the plant was operating at seventy-one per cent efficiency.

The piping system of the hospital is most complicated because of the varied service demanded. There must be, first, the high-pressure piping system operating at the maximum pressure required, which would be that required by the engine if a lighting plant is included, or that required by the laundry and sterilizer system if no lighting plant is included. Ordinarily the hospital lighting plant is operated at eighty to one hundred pounds steam pressure and this would thus be the boiler pressure. The sterilizers should then be provided with an independent system of piping conveying steam at approximately sixty pounds pressure. The pressure required for the operation of the laundry apparatus is the same, but usually the laundry apparatus is so located that a separate system of piping may well be used therefor, and this is desirable in any case. The kitchen apparatus requires steam at approximately thirty to forty pounds pressure and should, therefore, be on a separate system of piping. The heating pressure, customarily two and one-half pounds, involves necessarily a separate system of piping. Each system is supplied with steam directly from the boiler header through an automatic pressure reducing valve.

Automatic temperature regulation fails to receive proper recognition only because a number of cheap

devices have been used for the purpose and many cheap installations have been made.

There are now available two or three systems free of rubber diaphragms and similar causes of failure, which may be counted upon to give accurate and lasting service. The use of such a system prevents overheating and results in marked economy of fuel.

In every plant steam and hot-water pipe covering is freely used, but the use of the highest grade materials is not as common as it should be. The use of the highest grade covering, which is naturally the most expensive, is amply warranted by the increased saving of fuel resulting.

The use of sheet metal ducts for conveying air in the ventilating system is to be recommended in preference to the use of masonry ducts and flues, despite the fact that the sheet metal ducts cost slightly more. The sheet metal ducts are cleaner and involve less resistance to the movement of the air.

The use of air washers provides for a supply of clean air wherever ventilation is required, and this alone should be sufficient to assure their use, especially within congested districts where ventilation is desired.

The ventilation system of the hospital may vary in its extent. It may consist merely of exhaust fan ventilation for the laundry, kitchen, toilet rooms, diet kitchens and other service rooms, which should be divided into separate systems for laundry, for the general kitchen, for the toilet and service rooms, and for the diet kitchens. This smallest amount of ventilation may be supplemented by an exhaust fan system of ventilation for the large wards, and to this may be added a fresh-air supply fan system for the wards and important patients' rooms.

The extent and nature of this equipment must be dictated by the nature and location of the hospital. A hospital located in a rural district manifestly requires less artificial ventilation than one located in a congested city district. The author believes that a complete supply and exhaust system for all of the larger patients' rooms is amply warranted in the latter case, for ventilation by natural means cannot be assured in the case of a hospital surrounded by high buildings, particularly on days of dull or stagnant atmospheric conditions, and the opening of the windows often subjects the patients to the annoyance of noise, dust, odors and drafts.

In connection with the plumbing equipment frequently resort is had to standard plumbing fixtures, with little consideration of the specially designed fixtures and equipments which several manufacturers make for hospital work.

For the drainage system wrought iron pipe is mostly used. For the cold water distributing mains galvanized iron or steel pipe is largely used. A more durable pipe is the lead-lined iron pipe, which costs possibly twice as much as the galvanized iron pipe.

For the hot water piping system galvanized iron or steel pipe is largely used, but this should never be, inasmuch as it is short lived. The gases liberated in the hot water attack and rapidly destroy the iron and steel pipe. Brass pipe is much more durable than galvanized iron or steel pipe, but is very expensive. For this work, also, the lead-lined iron pipe will be found quite as durable as the brass pipe and about one-third less expensive.

In general, the hot water supply is furnished by means of large storage tanks containing steam coils. Considered from all standpoints, this is the best means. It provides for an ample storage of hot water and eliminates the sudden demands on the boiler caused by instantaneous heaters having no storage capacity, or by the steam and water mixing valves. Such instantaneous heaters and local mixing valves make necessary the installation of sufficient boiler capacity to provide steam not only for heating and other hospital purposes, but for heating the water to the extent of the maximum instantaneous demand, while in the case of the storage heaters the peak, or maximum load on the boilers, is lessened because the heating of the water may be accomplished through a longer period of time.

Incinerators are generally used in all large hospital plants. They should be of the high-pressure pattern and of ample capacity. A single large incinerator located in the basement is usually found more satisfactory than the smaller incinerators distributed about the building, because of the fact that the smaller incinerators may not economically be operated continuously at a sufficient temperature to destroy all refuse matter and garbage without offensive odors or smoke.

Nearly all large hospitals, that is, institutions costing \$250,000, or more, have their own electric power plants. No institution or type of building has greater warrant for the installation of such a plant than the hospital. It has the longest period of heating of any type of building and the greatest possible use for the exhaust steam from the engines. The exhaust steam may be used for heating the building, for heating water, and it may be used to a large extent for drying purposes in the laundry. It may also be used in refrigerating plants of the absorption type. The latter has the special advantage of making use of the exhaust steam at a period of the year when a considerable portion thereof could not otherwise be used. The large amount of hot water required in the hospital also provides for an unusually extensive use of the exhaust steam during the non heating season.

The heating demands of a hospital will be found to be three to four times greater, as related to boiler capacity and fuel consumption, than the demands for electricity. The installation of the electric power

plant will not increase the boiler capacity required or the fuel consumption during the greater portion of the heating season. The additional amount of service required because of the installation of the electric plant is very small. In very small hospitals no extra service is demanded, in medium-sized hospitals one extra man may be required, and only in the largest hospitals will two or three additional men be required.

Usually the installation of an electric power plant will pay for itself within three to five years, including proper allowances for interest and depreciation. The extra cost of service is largely offset by the increased economy in the operation of the heating plant because of the higher grade of service employed.

Protection against interruption of service is quite as great in the case of street service. In connection with over fifty isolated plants designed by the author no interruption of service has ever occurred and some of these plants have been in service twenty years.

It is an interesting fact that of the thirty-one hospitals on Manhattan Island, which have one hundred beds or more, seventy-eight per cent of them have their own electric lighting and power plants. Of the remaining number several are city installations and the policy of the City of New York, which is believed to be largely influenced by political motives, is against the adoption of isolated plants in city institutions.

It may be asserted that in no other department of hospital administration are the losses and wastes so great as in the maintenance and operation of the heating, power and mechanical equipments.

The ability of the operating engineer (and the ability of his assistants) and the efficiency and economy of the plant go absolutely hand in hand. The employment of cheap engineers and firemen inevitably means high fuel, water and repair bills and an increased depreciation of the plant.

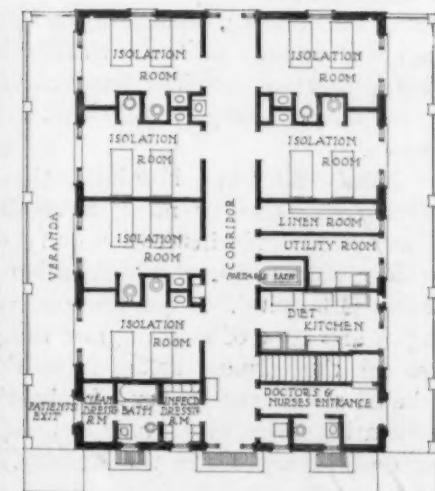
The best efforts of the consulting and operating engineers may fall far short of the best attainable if the building committee or architect so reduces the amount available for the installation of the mechanical equipment that the best materials may not be used, or to such an extent that devices to determine the economy of the plant's operation must be omitted. The use of cheap valves, pipe and other materials will result in constant annoyance and high repair bills. The use of cheap steam and hot water pipe covering materials will result in an excessive waste of heat, which may be neither detected nor prevented. The elimination of coal scales and boiler feed water measuring devices will surely result in a low boiler plant efficiency. Elaboration in the mechanical equipment is to be avoided by all means, but the essential requirements may not be ignored without involving a continuous and serious expense.

## Isolation Building of the Hurley Hospital, Flint, Michigan

DAVIS, McGRATH & KISSLING, ARCHITECTS



View of Corridor Showing Nurse's Station



First Floor Plan

This plan shows a complete and well arranged isolation building for twelve patients. Each ward is an independent unit, having its own toilet facilities and exit to outside terrace. A portable bathtub provides bathing facilities. The second floor is given over to a nurses' sitting and dining room, together with three nurses' rooms, a small kitchen and maid's room. A separate entrance gives access to this floor. The plan was developed in collaboration with Dr. S. S. Goldwater.

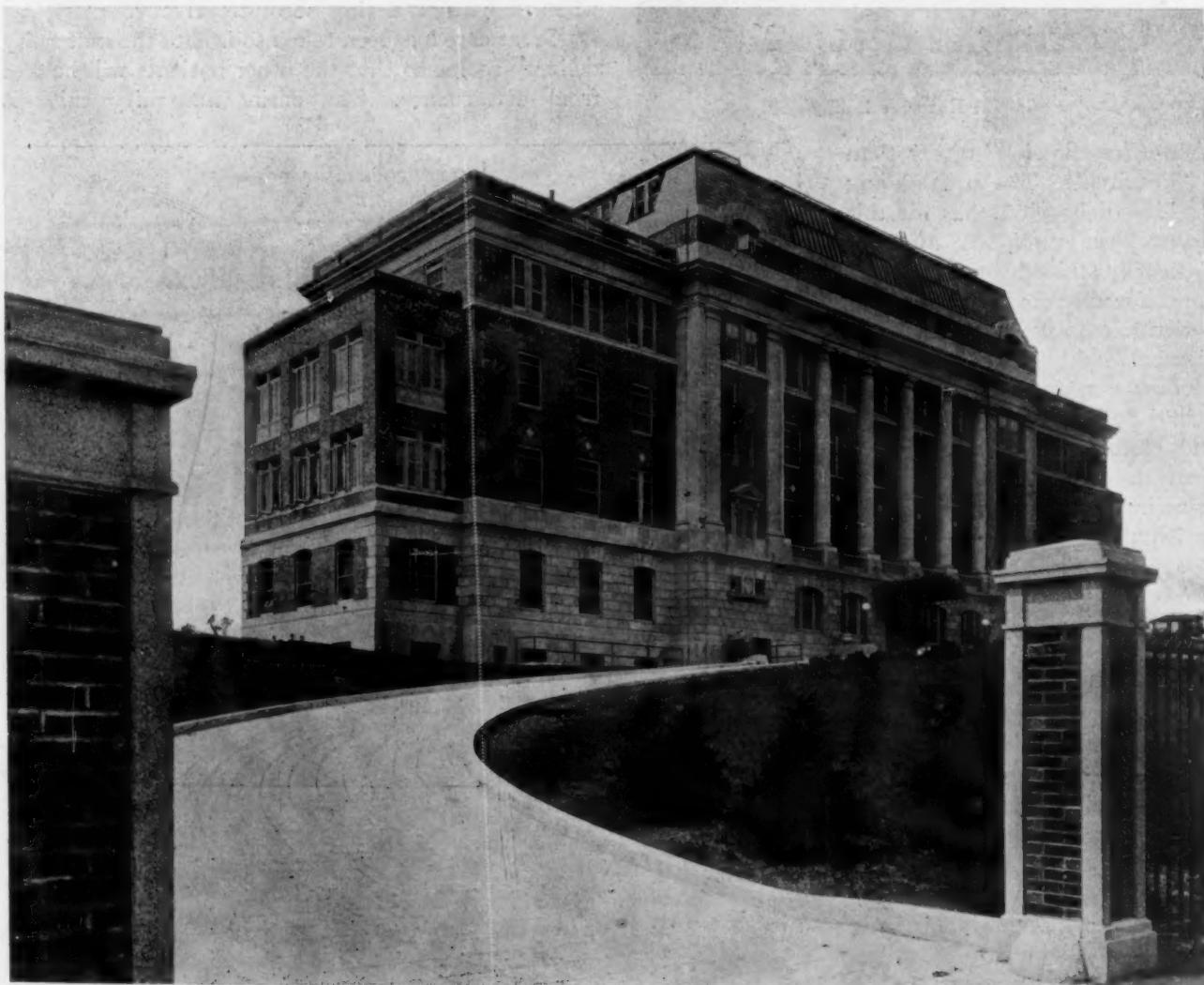
## The Carson C. Peck Memorial Hospital, Brooklyn, N. Y.

LUDLOW & PEABODY, ARCHITECTS

DEVELOPMENT of hospital planning and equipment for a number of years has been along lines of greater sanitation, specialized equipment, and above all, interior construction and finish carried almost to a point of barrenness with flat surfaces and rounded angles in fear of the deadly lurking germ. But in this great movement for sanitary conditions, the psychological effect of surroundings on the patients has in many cases been overlooked. Some observers of modern hospital facilities claim too great stress has been laid on sanitation and that, as a result, many effects of a depressing nature have been created. The hospital building should be constructed and equipped so as to be easily kept clean, but above all else it should make an appeal to the patient through its restful character, so that the days of convalescence may be as cheerful and comfortable as possible, thereby aiding in rapid recovery. There is now being evidenced

a keener appreciation of the necessity of this dual viewpoint. It has been pointed out that hospital buildings have been made unduly expensive by the employment of tile and marble floors and wainscoting, with coved intersections of walls and ceilings in departments where little value was obtained, that glistening white surfaces and furniture have been over-rated from a sanitary standpoint and that in addition to creating a chilling and depressing effect on the patients, their reaction on the physicians and nurses is not such as to promote harmonious and restful working conditions.

The Carson C. Peck Memorial Hospital recently erected in Brooklyn, N. Y., is an interesting example of the application of some theories which a short time ago would have been held quite contrary to accepted hospital practice. The underlying thought in the design of this building was that it was to be made a



General View of Facade From Approach



View in Entrance Lobby

"home for the sick" rather than a "hospital." The usual blank sterility of hospitals has for this reason been studiously avoided. Tastefully stained wood trim and doors for all rooms occupied by patients, oak floors toned to a pleasant light brown, washable window curtains of quaint and dainty design, rugs on the floors, and pictures on the walls have been used with the purpose of bringing cheer and comfort to the patients under treatment. The rooms are furnished with bedsteads attractively colored and with other furniture of oak or mahogany. Large windows are provided everywhere to give maximum sunlight. The toning of the walls is a cheerful sunlight buff. The solariums at the ends of the building have large glazed openings, and the porches on the rear are approached from the adjacent bedrooms by wide casement windows, which allow beds and wheel chairs to be rolled directly from the rooms on to these porches, which not only

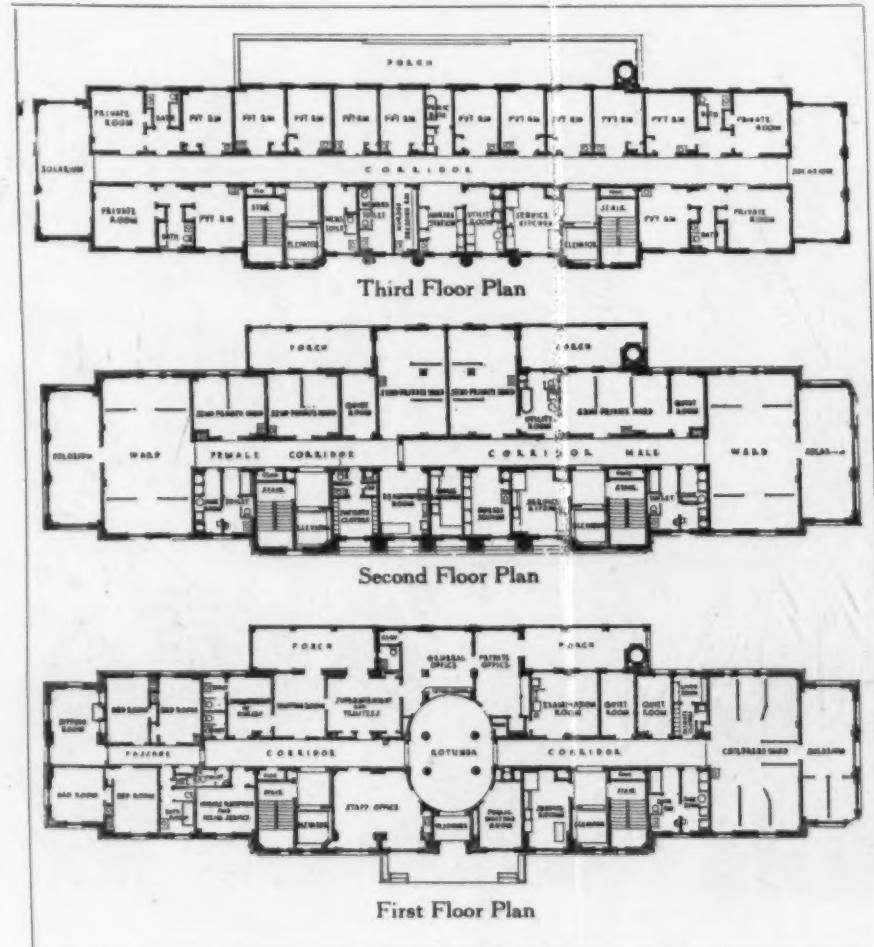
receive full southern sunlight, but look over a stretch of many miles of Brooklyn toward the bay.

Meals are served to the patients, not only in steam-heated trucks, to maintain the warmth of the food, but on dainty crockery of many different designs, so that each patient may have the anticipatory pleasure of a changing appeal to the mind.

The lighting of each private room and of every bed in the semi-private wards is by means of a fixture slightly above and directly back of the patient, so that no disturbing light will fall in the patient's eyes, but will be directed to the place needed for reading or for services to the patient.

A large number of the rooms are for individual patients. Some are semi-private with two or three beds in a room and there are several wards which contain six to eight beds. Wherever there is more than one bed in a room, screens have been placed between the beds, so arranged with a lower metal panel and glass above, that the patients lying in bed cannot see one another and yet the nurses can have full surveillance of the room. In addition to this, provision is made so that curtains can be drawn around any particular bed when the patient desires absolute privacy.

Great care has been taken to isolate the maternity delivery rooms so that the other patients will be free from disturbance. The entire maternity suite is



placed on the next to the top story, to give it special quietness and isolation.

Special attention has been given to the elimination of noise throughout the building. The elevators open from vestibules rather than directly into the halls. Clicking door latches are entirely omitted, noiseless self-closers being substituted and arm hooks instead of knobs, so that the nurse can open the door while both hands are occupied. The partitions between the bedrooms and between the bedrooms and the halls are built double, with an air space between the parts to prevent the transmission of sound.

The signal service from the beds to the nurses is by means of tiny electric bulbs, which operate with the utmost efficiency, as well as producing the best psychological comfort to the patient. The pear push, hanging on a wire at the patient's bed, registers in the nurses' station, in the sink room and in the diet kitchen on the same floor and also in the head nurse's room on the first floor, so that the head nurse may know by the duration of the light, the promptness with which calls are answered. The signal cannot be released by the nurse until she has come to the patient's bedside and pushed a ring on the pear push from which the call was made. In order that the patient may not be left in doubt as to whether his call is registered, a small signal lamp is placed inside the patient's room, over the door, which shows a tiny red light when



Detail View of Facade

he pushes the call button.

The usual hospital requirements for sanitation in the sink rooms and diet kitchens, and every possible facility in caring for patients are carried to a far point.

The accommodations for children are on the first floor where they are easy of access and require practically no elevator service.

The corridors are divided into units, and doors so placed that, as necessity requires, certain groups of rooms can be used for male patients, separated from the other rooms reserved for the female patients.

The operating rooms are provided with the usual skylighting. Artificial light is produced by placing reflectors directly over the ceiling sash, and by bordering the vertical parts of the skylight with incandescent lamps, the same direction is given to the rays as that of the natural daylight. All the artificial lighting is behind glass surfaces to insure diffusion of the light and prevent accumulation of dust on fixtures.



View in Children's Ward Showing Metal and Glass Screens and Curtains for Privacy



View in Private Room Showing Opening to Solarium

The walls in these rooms are wainscoted seven feet high with a cool grey tile and a similarly toned paint covers the plastered walls and ceilings above. This does away with the glare from the usual white walls and tile, and yet does not absorb too much of the light.

In working out the details of planning and equipment, the architects were assisted by Mr. Charles F. Neergaard, Secretary of the Board of Trustees of the hospital, acting in the capacity of hospital expert.

The entrance lobby, with its cheerful Pompeian tones, its ample light and air, and curtained windows, makes one feel on entering the hospital a sense of warmth and homeliness.

The exterior of the building proclaims its special use, the required admission of large volumes of sunlight and the large windows for the operating rooms are evident at once. The semi-monumental design indicates something of the memorial, yet lack of austerity eliminates any institutional appearance.

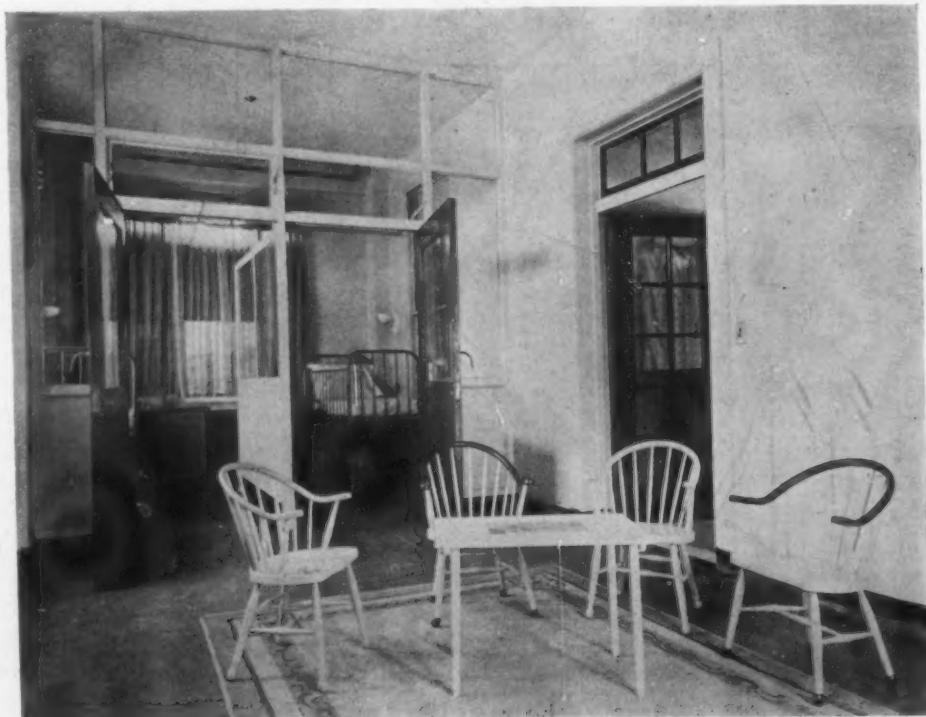
The hospital was built by Mrs. Carson C. Peck in memory of her husband; her idea was to provide a much-needed place for persons of moderate means, and the endowment fund helps to reduce the cost to the

patients for service of a sort which otherwise would be rather expensive.

The hospital has been in operation for several months and the element of comfort and cheer to the patients, which is the dominant note of the building, has not only proved its great value from the patients' view-point but has been commented upon by doctors and nurses generally, being a real step in advance in providing an environment conducive to contentment and thus to convalescence.

There is a special opportunity afforded architects for the exercise of sympathetic treatment of design in the case of hospital buildings. The building must be more than an institution for the treatment of disease; it must be

thought of as a resting place for the sick, and as such, every effort should be made to create an atmosphere of comfort and harmony. The significance of benefits that might come to the patient from allowing his eye to rest upon objects of pleasing form and color has been overlooked by the medical profession in its desire to create hygienic conditions, and it is incumbent upon the architect to modify this influence through study of the problem from the broad angle of the patient's comfort.



View in Children's Solarium

# Architectural and Building Economics

*A Department Devoted to the Determination of Factors of Efficiency and Economy in Building Construction and Civic Development as Affected by Architectural Design*

C. STANLEY TAYLOR, ASSOCIATE EDITOR

ONE of the interesting features of the reconstruction period is the generally broader basis upon which business activities of every kind are being established. It would seem almost as though the enforced rest period of the war had provided a breathing space during which business men have had an opportunity to consider from all angles their normal business activities. Owing to war pressure, speed of production in almost every line has been developed to an almost unheard-of degree. The vision of the individual has been broadened. He has learned to see matters in a more comprehensive light and to consider issues, and in the profession to apply sound business principles to a degree never before known.

Perhaps in no profession or general class of business can interest in the problems of the reconstruction period, and the development of business along broader lines, be more definitely noted than among architects. True, this interest is not all-inclusive, nor is it as noticeable in certain sections of the country as in others; but, generally speaking, there is being evidenced today on the part of the architect a definite desire to analyze the possibilities of the profession toward the rendering of a broad, clearly defined service to the public.

There are several factors which have recently been instrumental in focussing attention on the possibilities of a more businesslike administration of the affairs of the architect. The exigencies of war-time conditions and a lean period from which the profession is now emerging, the imminence of a growing and well stabilized building boom, the readjustment of building material and labor costs and the necessity for greater efficiency of purpose in the design of buildings of every type — all these factors have had and are having their effect in the form of a general house-cleaning in preparation for the activity of the next few years. The difficulty of obtaining financing for building operations is also leading the architect to a more comprehensive study of economic elements which affect his practice. Certainly, there has never before been shown so great an interest in the factors affecting a building operation, which in times past have been left entirely to the real estate and mortgage broker, the building manager and the financier.

The architect is lifting his eyes from the drawing board to peer into the world of business. Almost with amazement he is learning the interalliance of investment and design; of maintenance and equip-

ment — of profit and construction cost. He is learning, too, that his splendid equipment of constructive imagination may be made to play an important part long before a particular building is to be designed and built; in fact, that the very inception of such a project may in many cases be in his own mind, or at least that his advice may be of distinct value in carrying out building promotion activities which will lead ultimately to attractive and interesting commissions.

THE Department of Architectural and Building Economics has been instituted in THE ARCHITECTURAL FORUM to meet a growing demand for practical information regarding the many business factors which are exercising an increasing influence on the practice of architecture. In this department there will be presented from month to month academic and expository articles dealing with various instructive phases of building and civic finance: promotion of building operations, maintenance, insurance engineering, efficiency of design from the business viewpoint, and similar subjects of constructive value in assisting the architect to meet the demands of modern business conditions and the competition of encroaching interests.

One has but to realize the tremendous responsibility involved in the direction of the expenditure of vast sums of money which will annually pour into the building field to know that for the architect a broader knowledge of the business aspects involved in the larger practice of his profession will prove invaluable in the establishment of true service to his clients. Buildings are the important tools of industry and commerce. The more efficient in purpose they may be made through the medium of studied design, the greater will be the economic contribution of the architect. Nor will it be necessary to sacrifice art to commercialism. The aesthetic interests of the community are to be maintained on a scale never before known. There will be no deviation from the sound principles and traditions of an honored profession; but a broadening of service consistent with modern progress — an acceptance of the responsibility incumbent upon producers of natural wealth in one of its basic forms — shelter.

The man who has constructive imagination and sound business ideas is the man the world wants today. It cannot be unethical to be possessed of what is termed "business sense" and to visualize the busi-

ness possibilities in any building project. Therefore it is evident that the interest of the architect should be directed as never before to the possibilities of serving his clients in a broader capacity through a knowledge of building finance and the general principles of building promotion.

At the present time many of the building operations which are getting under way are in this class and some of the more important of these have been the result of careful study and development on the part of an architect. In New York City we find a great office building ready for immediate construction which was greatly aided in its promotion and financing by an organization of architects. In Cleveland a co-operative apartment; in Detroit a vast projected housing development; and in various sections of this country and Canada, hotels, port terminals and

industrial buildings are being aided in promotion by a few architects and engineers who have foreseen coming developments and solved the problem of immediate work through the application of constructive imagination.

It is evident, therefore, that because of its business possibilities great interest attaches to this subject of building promotion, and for some months principal consideration will be given in this Department to an analysis of the various factors of such promotion and the manner in which it may affect the average architect's practice. A detailed study will be made of the types of building operations more easily subject to promotion in various localities; the methods of developing such projects; financial methods and questions involved; and the relation of the architect to work of this character that may come into his office.

### Building Operations Subject to Promotion at This Time

ONE of the first factors to be considered at this time is an analysis of various building operations for the purpose of determining the more logical field in which promotion work can be carried on with advantage at this time. The measurement of feasibility which can be applied to any building promotion project is constituted principally by the demand for the particular type of building space which may at present or in the very near future exist in the locality under consideration. It is at present plainly useless to attempt the promotion of any type of building operation unless the occupancy demand is so great that immediate rentals and even sales may be confidently expected.

Classified generally and from a national viewpoint in their apparent order of importance we find that the demand for buildings of various types is as follows:

- Dwellings (Multi- and single-family.)
- Industrial Housing.
- Hotels.
- Office Buildings.
- Educational Buildings.
- Community and Amusement Buildings.
- Waterfront Construction (Terminal Buildings, Warehouses and Docks.)
- Industrial Buildings (Small Manufacturing and Loft Types.)
- Religious and Institutional Buildings.

In this connection the Information and Education Service of the United States Department of Labor has been making careful analysis of building operations now being started in various localities and a brief consideration of some of the findings resulting from such careful research will be of interest. Following is a recent weekly report of this organization

on new construction work which will serve to demonstrate the importance of the classes of buildings outlined in the preceding paragraph:

<i>Project</i>	<i>Number</i>	<i>Valuation</i>
Bridges, culverts	32	\$433,005
Clubs, hotels, institutions	37	1,969,430
Federal, State, Municipal	34	10,206,192
Garages, stables	173	1,303,740
Industrial	328	13,790,162
Public Work	143	8,020,275
Residential	1,644	9,293,111
Schools, churches, theatres	71	6,518,693
Stores, offices, banks	227	7,483,477
Terminals, railroad stations	1	1,500,000
Miscellaneous	23	346,000
	2,713	\$60,864,085

In order that intelligent determination may be made of types of buildings which may be subject to promotion and to determine logical methods of approaching individual projects, the various classes of buildings outlined in foregoing paragraphs should be considered singly and in some detail. From such consideration logical arguments which may prove of value during negotiation can be developed. Conditions and facts outlined in following paragraphs must naturally be subject to modification to fit local conditions and business and financial methods. The fact that this article is prepared for readers in New York and California, Texas and Michigan — as well as in Canada, will necessitate recapitulation according to the variance of local conditions. In general, the following discussion will represent a mean between high and low unit realty values and similar degrees of cost in financing.

## DEVELOPING DWELLING PROJECTS FOR DESIGN

In view of the fact that the housing shortage has reached a point of pressure never before equalled in the United States and Canada, a considerable degree of publicity is being given to the subject — both nationally and locally. Reports have it that we are one million homes short in the United States and from first-hand information gathered by the writer on recent trips through the South and West it would seem that this report is not over-exaggerated.

In representative cities such as New York, Detroit, Montreal, Toronto, Philadelphia, Norfolk, Seattle and St. Louis the need for additional homes has become imperative. Typical of the pressure exerted by a lack of normal building for some years past is the cry now being raised almost universally against rent profiteers. In general, the price asked for single dwellings varies from sixty to one hundred per cent over the asking price of five years ago.

In New York a peculiar speculative real estate activity has swept the market as a result of the lack of housing. Real estate speculators have been buying hundreds of apartment houses for the purpose of reselling at a quick profit. The method usually followed is to offer the owner from six to seven times the annual rental as a purchase price for his building. After the building is purchased all rents are raised on one pretext or another and the tenants are usually forced to pay the increased rental, as no available space can be found into which to move. As soon as the rent roll has thus been increased the property is offered for sale on the seven times annual income basis. In this manner, on a purely speculative basis, rents are forced to the maximum throughout the city. Kindred operations are being carried out at practically every point of housing shortage in America. It is significant of coming building activity, however, that the attention of speculators is now turning to the building lot field.

This dwelling field provides an exceptional opportunity for investment, offering good returns. It is divided into several classes of housing, each of which must be considered as a separate unit. These are: individual and two and three-family houses, apartment houses and industrial housing. Each of these fields offers splendid opportunity for development, and the necessity for careful architectural development from both economic and aesthetic standpoints was never greater than today.

## THE FIELD OF INDIVIDUAL DWELLINGS

There are various factors which have operated to bring about a strong demand for individual dwellings in both city and suburban locations. Among these may be noted: the unsatisfied normal demand for such housing; the desire of former apartment dwellers, disgusted with rental increases to the point where they are ready and anxious to purchase homes; the equal desire of tenants of individual dwellings who

have been ousted through the sale of their rented houses to new owners for occupancy; and the fact that many families, through the medium of lucrative wartime employment, are for the first time in a financial position to own their own homes.

From the viewpoint of the promoter, therefore, it is evident that here is a field ready for operation. As the architect, through the medium of encouraging and advising on building operations, seeks as his payment no fee other than that covering the commission to design and supervise their construction, it is evident that in order to make the project pay it must involve the building of at least ten moderate-cost houses. Stress is laid on the term "moderate-cost house," as the great demand is for homes costing less than \$10,000 — preferably from \$5,000 to \$7,000.

The best appeal for this type of promotion is to the investor who has a speculative turn of mind — but who wants a strong factor of safety in any operation even at the sacrifice of high profits. High profits should not be sought in a home-building speculation for the reason (aside from those of fairness and economic necessity) that profits must be sought from the increased value of the land — rather than a profit on the building.

Building costs are of course abnormally high at present; and sustained by an increasing demand, they will be lowered in years to come only by keen and increasing competition among material dealers — a problematical condition at best. Land, however, is practically the one stable form of property-holding which has not enjoyed a general increase in value. This increase is to come, however, even as the purchasing power of the dollar has decreased, and real estate generally is to feel a "boom" undreamed of in its proportions. *At present, the key to the increase in the value of land available for residential purposes is the building of homes in the immediate vicinity.*

## DEVELOPING THE SUBURBAN RESIDENTIAL PROJECT

Of the two, the suburban residential development (as opposed to the city project) is generally the more difficult to develop at this time, for the reason that the demand for city houses at low cost is greater; and as land values in the city are better stabilized it is easier to get money for the city project in a difficult financial market.

To bring into actuality a suburban housing development chosen at random and to actually cause the construction of houses (to design which the architect may be commissioned) it is at present almost useless to approach the ordinary investor. A much better opportunity is offered through determining a suburban section in which there is an unsupplied demand for houses and where real estate activity is beginning. Usually in developing such operations it is found best to enlist the services of a competent real estate man who knows the section and who, for his interest in

the project, may handle the real estate transactions involved and benefit by commissions which he may be placed in a position to earn.

Having determined on a section for investigation, there are two details which should be learned immediately: First, who are the owners of particularly desirable tracts of land in such section; second, what interests have recently acquired land in the neighborhood. It will be found generally that land purchases are already being made for future building in desirable suburban residential neighborhoods.

The direct appeal to owners of large tracts of land, which they are desirous of selling as building lots, may be made through a proposed building project on the sound and timely basis that by building a comparatively small number of houses they may start land selling activity. Buyers of subdivision or allotment lots are in the future to be a very different class, or at least they will follow a different method, than in years past. In Canada it is said that every man and almost every woman owns at least one lot, purchased usually from a blueprint and having a potential value which may only be realized decades or even centuries hence. Certainly, as lot owners, the citizens of the United States run the Canadians a close second.

Following the logical course determined by such disillusionment, the lot buyer of the future will want to see some houses built close to the land he purchases — to know that he is to have an opportunity to enjoy the increment which is promised when a neighborhood really begins to "build up." The wise owner and buyer of residential areas for development will therefore build some houses on his tract — and he will be the first to sell when the million lots for the million homes America needs are called for.

Here, then, is the appeal — the reason why suburban developers should "build now." Even if they do not profit on the sale of the first houses built there will certainly be an increased market for the balance of their property and at a better figure.

The fact that a building proposition can be financed has a direct appeal to an owner which practically guarantees a new commission for the architect. The logical steps to be taken in promoting this type of suburban residential building operation are therefore as follows:

(1) Singly or in co-operation with local real estate brokers to determine possible clients (owners or recent buyers of residential tracts of land).

(2) To take up with local banks, building loan associations or other financial sources the question of their willingness to finance new houses. (If a source of mortgage money can be determined before taking up the proposition with the owner a strong argument is added to the work of promoting the new building operation.) Incidentally, as mortgage money for building suburban houses is still "tight" it might

be interesting to describe the method by which an Ohio architect recently financed sixty houses. In this case the architect had a possible client who owned property ready for development and who was willing to build houses provided loans might be obtained. One bank was found, willing to make a loan of fifty per cent of the value of land and building, but the owner was not willing to go into the proposition with fifty per cent of the cost in cash. The architect solved the problem as follows: The land involved was free and clear (unmortgaged) and the owner, at the architect's suggestion, offered to the bank, as collateral, not only the lot and house involved in each loan, but three additional lots with each house. Resorting to figures as a better means of explanation we find the following:

Estimated cost of each house, includ-

ing proportion of street improve- ments.....	\$6,000
Appraised value of each lot.....	<u>1,300</u>
Basis on which bank would loan 50%	\$7,300
Or a first mortgage of.....	<u>\$3,650</u>

On this basis the owner, already having possession of the unmortgaged lot, must invest in building construction on each house the following:

Cost of construction, each house ..	\$6,000
Money obtained on bank loan.....	<u>3,650</u>
Cash investment in each house.....	\$2,350

Or for sixty houses, \$141,000.

The above amount was more than the owner was willing to invest, but the architect's solution of adding three lots to the collateral for each loan worked out as follows:

Value of house and lot as shown above	\$7,300
Bank willing to loan on this.....	<u>\$3,650</u>
Value of three additional lots, forming plot of house and four lots.....	3,900
On which bank was willing to loan an additional forty per cent.....	<u>\$1,560</u>

Total value of land and house.....	\$11,200
Total loan on each house, four lots...	<u>\$5,210</u>

On this basis the owner, by putting up additional lots as collateral, has only to invest in actual cash for the building of sixty houses as follows:

Cost of construction, each house ..	\$6,000
Loan from bank on above basis.....	<u>5,210</u>
Cash investment each house.....	\$790
Or for sixty houses, \$47,400, plus additional cost of improving streets.	

The sound business value of this transaction is apparent and it might be interesting, as proof, to analyze the position of each party to the transaction at the time when the sixty houses were completed, each on a plot of four lots, three of which, each subject to a mortgage of one-third of \$1,560, were available for subsequent sale. (A clause in the mortgage

made possible separate payment of this amount, leaving house and lot subject to mortgage of \$3,650.)

*The bank* has ample legal collateral for its loan.

*The owner*, having originally a large tract of undeveloped land, now has sixty houses; a number of improved lots for sale at increased value due to improvements and erection of houses; and the increment on the balance of his tract of land incident to the erection of a large number of houses in the immediate neighborhood — an increase of at least fifteen per cent over the original value.

*The architect* has received his fee for design and supervision of construction on a \$300,000 operation.

These figures are given in detail to explain an

interesting building transaction and to show the value of business judgment on the part of an architect.

(3) The final step in this type of promotion is to co-operate with the owner in developing the financing of his project, at which time the architect is ready to take the newly developed commission into his office. It is evident from the above information that the property under consideration should be clear of mortgage or other encumbrance in order that the transaction may be financed.

Further details of the promotion of a suburban housing development will follow in the July issue in an article entitled "The Organization and Administration of a Suburban Realty Development Company."

## The Selection of a Site for a Suburban Development

THIS interest in suburban house building is naturally not confined to the question of house types but includes the selection of proper sites for development; the method of laying out these sites; and the establishment of a selling plan which will appeal to the average buyer.

Following back through the comparatively recent history of suburban development, we find that in 1904, 1905 and 1906 house building and lot selling was fairly active around the larger Eastern cities; in the West, particularly in the vicinity of Detroit and Cleveland, there existed an active interest in this field in the period before the war. During both periods there was considerable activity in the larger cities of Canada.

The fact that this activity came practically to a standstill in 1907 and 1908 in the Eastern cities, and during the early stages of the war in cities of the West and of Canada, has given a period of several years in which suburban development has been in what might be termed a ripening stage. Very little new work has been carried out and an excellent opportunity is provided to study the working out of various plans and methods in vogue some years ago. From these results may well be determined the better methods to follow during the years of greater activity, which are confidently and logically expected to develop soon.

Among the various factors which experience has shown exercise direct influence on the success of a development, the more important are:

Natural attractiveness of the land selected.

Character of neighborhood.

Layout of streets and lots.

Engineering and mechanical improvement costs.

Transportation.

Overhead and carrying charges against property.

Overdevelopment without building.

Existing community facilities.

In the success or failure of suburban developments the factor of natural attractiveness has its direct effect in the impression made upon the prospective buyer. Therefore it is apparent that not only must

advantage be taken of conditions of the wild land which may be maintained, to add to the attractiveness of the improvement, but the value of the skillful service of the competent landscape architect has never been more clearly demonstrated than in the result of various suburban development projects.

An excellent example of this condition is to be found in a development near one of the smaller cities of New York State. Here a large tract of land was selected for development, located at a most logical point with good transportation facilities to the heart of the city. All roads leading to the property were in good condition and the possibilities for a successful operation were excellent. The weak point in this development, however, was the failure of the owners to employ trained service in laying out the property.

The contour of this property in the front section resembled a shallow bowl two thousand feet in diameter with a difference in elevation of approximately thirty feet between the central point and the main highway. Toward the center and rear sections the land rises to form an attractive level plateau. On three sides of the property attractive vistas are established by rolling land and woods, but on the fourth side an ugly abandoned brick plant spreads its low, unattractive buildings and stripped clay pits.

In laying out this property the center of the hollow was taken almost as the hub of a wheel with roads leading to it and passing on across the plateau in the rear. To further accentuate the hollow (and almost deliberate in its inadvertence) the first house built on the property was placed at the very base of the bowl.

The result was the accentuation of the low section of the property. As no attempt was made to drain any but built-up property, large pools of water stood at this point after every rainstorm. The impression upon the prospective purchaser was not conducive to buying. The simple solution of this problem would have been to create a small artificial lake at the low point, adding to the beauty of the property and creating an entirely different impression.

The unattractive brick-plant vista should have been cut off by planting, which at low cost would have added thousands of dollars to the value of the property; or the plant could have been purchased at low cost and demolished. In the minds of prospective purchasers of lots, as they refused to buy, were two thoughts, one of low and possibly wet land and the other the ugly vista of the abandoned brick plant. Because of these conditions and for no other reason the development was a failure.

In selecting land the character of the neighborhood is of prime importance. From the business viewpoint it is unwise to attempt to place any higher type of development in a given neighborhood than may conform with the general character of the community. An example of failure in this regard may be found in a development which was started and abandoned near Brooklyn, N. Y. In this case the land selected could be reached by one line of transportation only — a branch of the elevated railroad. Unfortunately this was a feeder line for a number of undesirable communities containing a large, low class foreign element. No market could be maintained for the good houses in this development, as the class of commuters to whom they were to be sold refused to travel in elevated trains crowded during business hours with factory and sweat-shop workers.

The extent of community facilities constitutes another important factor. Schools and stores must not be far distant, nor places of simple amusement such as motion picture theatres. The road which children must take in going back and forth from school is always a subject of serious attention on the part of the prospective purchaser.

The possibilities for the layout of streets and lots and the probable costs of engineering and mechanical improvements must be given serious consideration before purchasing land for development. This entails a study of contours; conformation and nature of the soil. The more important points to note are:

(1) Can streets be provided without excess grades or grading and filling cost? It does not follow that the layout must be of the gridiron pattern and the land flat; but it must be possible to put in a system of main roads which will carry traffic by easy grades to every section of the property.

(2) Where are the nearest points for water, sewer, gas and electric connection and how expensive will be installation throughout the property? Will a disposal system be necessary for sewage? If the cost of such mechanical installation, roads and sidewalks brings up the cost of the individual tract of land to more than 20 per cent of the cost of the average type of house which will be built on this property, the proposition is not economically sound.

(3) Consideration must also be given to the probable overhead and carrying charges of the property while in process of selling through a period of several

years. On one large development north of New York City a serious error was made in plotting too much of the property and filing the new map. This property immediately became subject to a much higher tax than in its original acreage form, in spite of the fact that nothing was done on fully eighty per cent of the land. It would have been better to file the lot map on a small section of the property at a time, saving on tax cost.

If the property in question comes within the limits of a city or town, the question of street improvements should be taken up with local officials in order to determine the restrictions and attitude of the community. It may prove that the city will take over the streets after they are built, if in accordance with local specifications. Also it may be possible to have sewer extensions and other mechanical improvements taken over and assessed throughout the district.

(4) From the insurance viewpoint investigation should be made of available fire fighting apparatus.

The question of transportation in its relation to the property is one of maximum importance; and a failure to appreciate the serious effect of bad transportation conditions has caused more failures in suburban development than any other single factor.

The time of transportation from the principal business sections should be at the most one hour and preferably about thirty minutes. The distance from the nearest point of transportation to the property should not be over one-quarter of a mile and preferably within five minutes' walk. Cost of commutation must never be forgotten as it may in many cases create too great an additional burden.

Another point of importance is that of roads good for automobile traffic. The evidence of the future is that practically every family which purchases a suburban home will own an automobile and the roads of the neighborhood must be good if the development is to achieve success.

There was never a time when so much care should be given to the selection of the land before money is spent on improvements and sales overhead. The public has money to buy, but the buying will be along more conservative lines than ever before.

One warning may be sounded for present and future developments. That is to determine how many subdivision lots, where improvements were put in under the low cost figures of several years ago, are for sale in the vicinity of any proposed new operation. Can this competition be met under present-day costs? Can lots in the new development, charged with the present costs of mechanical improvements, be placed on the market at values less or even equal to those of the older near-by developments? If they cannot, there are but two alternatives — houses must be built and the immediate development of increment in land values thereby started; or another neighborhood must be selected for development.

## New Garden Apartments, Queens County, New York City

A GROUP OF BUILDINGS NOW UNDER CONSTRUCTION  
SHOWING ECONOMY IN PLAN AND NEW PRINCIPLES OF LAND DEVELOPMENT

ANDREW J. THOMAS, ARCHITECT

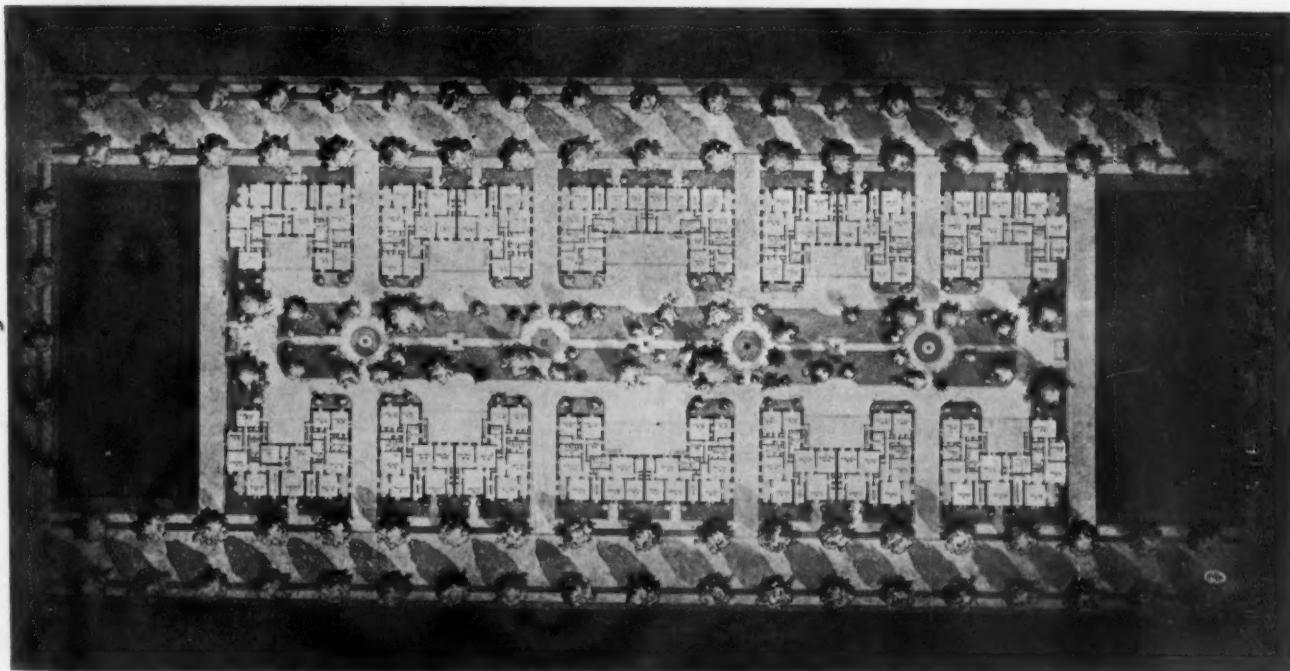
THE housing shortage in most of the large centers of the United States has been receiving extended attention for some months past because of its having reached such an acute stage as to be easily observed by the public, particularly so as it has directly reacted on a large percentage of people through increased rents. In spite of the publicity, the great demand for rented quarters, and the attractive return that present rentals show on real estate investments, little activity toward supplying housing facilities has been in evidence because of the timidity of investors who have been unable to see the continuance of high building costs, and have feared that buildings erected now would in a few years be at a disadvantage with those erected later. Each recurring day, however, sees this theory giving ground, and in fact the latest reports of building contracts would indicate that it was nearly exploded.

It is interesting to note that the largest building operation to be undertaken in New York since the signing of the armistice, is one that will provide housing accommodations for 144 families. This has not been projected for philanthropic reasons but as a business investment, and involving the expenditure of \$600,000, including land, as it does, it proves that the developers, The Queensboro Corporation, have found ample reason to proceed with

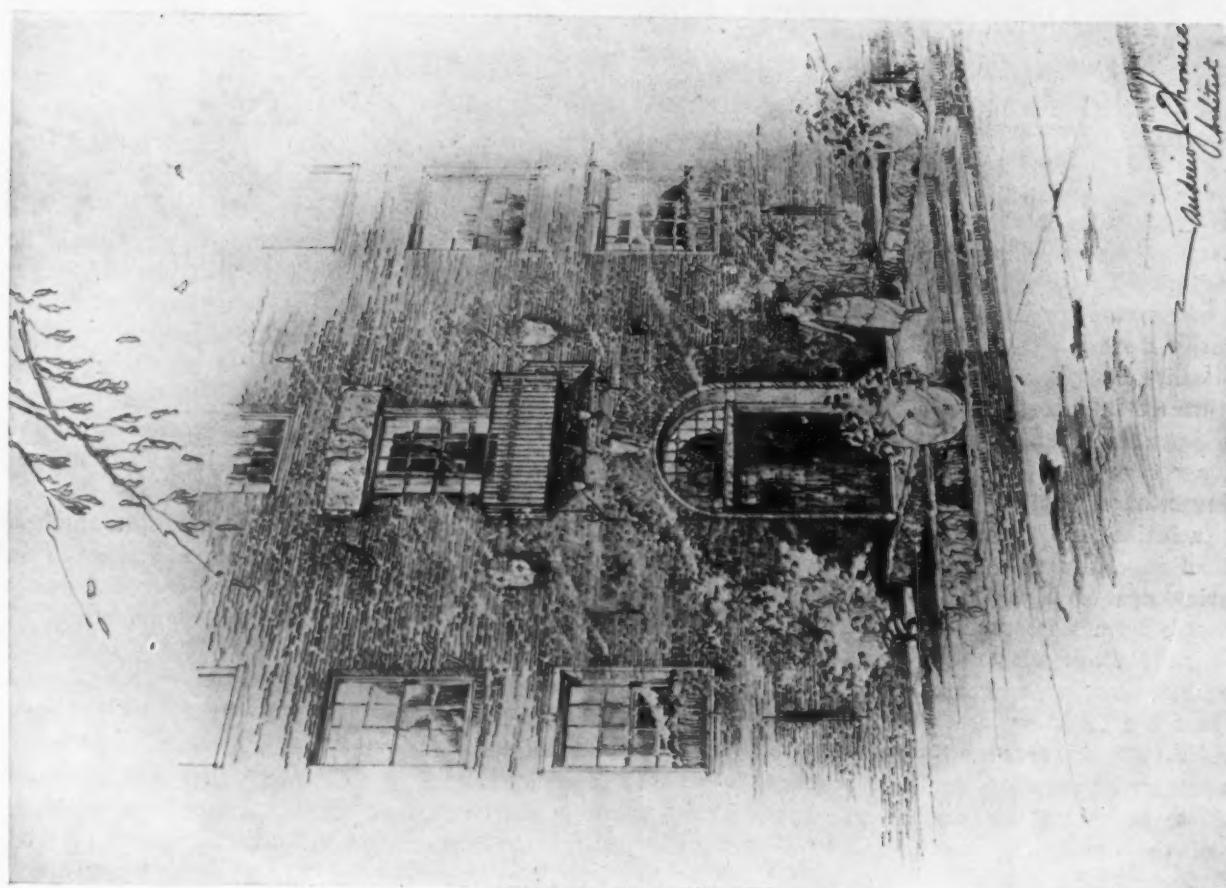
building. The operation is, therefore, of significance because of the economic reasons that induced the owners to undertake building at this time of general uncertainty, and furthermore, because of advanced principles of planning that characterize the group of dwellings and are directly responsible for their moderate cost, and the particular environment surrounding the development which makes its operation attractive from a real estate point of view.

The building industry has probably been more demoralized by the war than any other fundamental industry, and yet the cost of building is estimated by the Department of Labor to have increased only about 22 per cent as compared with an increase of 67 per cent in the cost of food and 80 per cent in the cost of clothing. It is believed by The Queensboro Corporation, that once the building industry resumes its normal activity, there will be a tendency to equalize the cost of these three fundamental commodities; in other words, the cost of building is apt to be higher next year, and the cost of food and clothing may be expected to decline somewhat.

Another important factor in relation to the cost of building is that it is estimated 75 per cent of the cost of a building operation is comprised of labor employed at the site, in the mill or in the brickyard. With the present high cost of living, and the marked



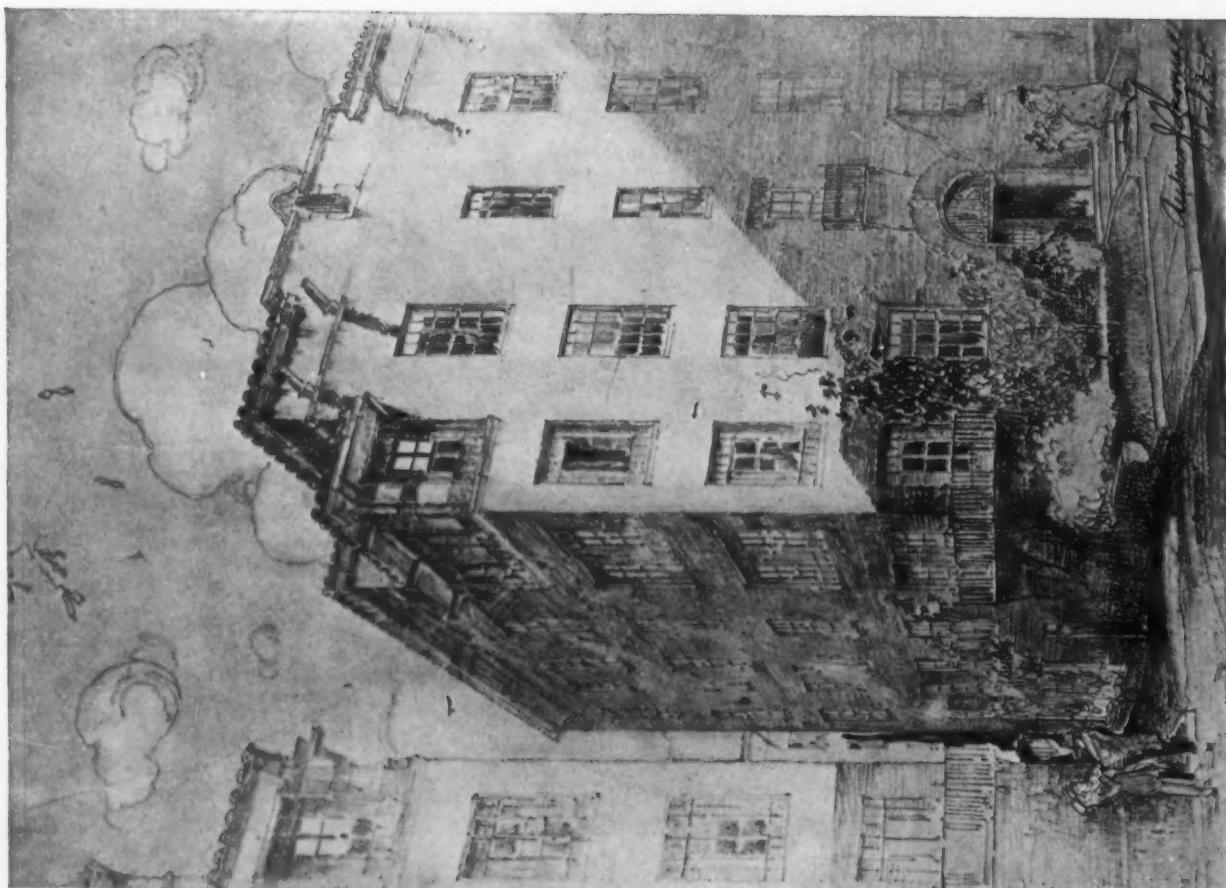
Block Plan Showing Location of Apartment Buildings on Plot 200x500 Feet. Side Courts are 15 Feet Wide and the Units From Center to Center of the Courts are respectively 83, 107 and 120 Feet, Reading to the Center of the Plan



DETAIL OF ENTRANCE DOORWAY

GARDEN APARTMENTS, JACKSON HEIGHTS, QUEENS COUNTY, NEW YORK CITY

ANDREW J. THOMAS, ARCHITECT



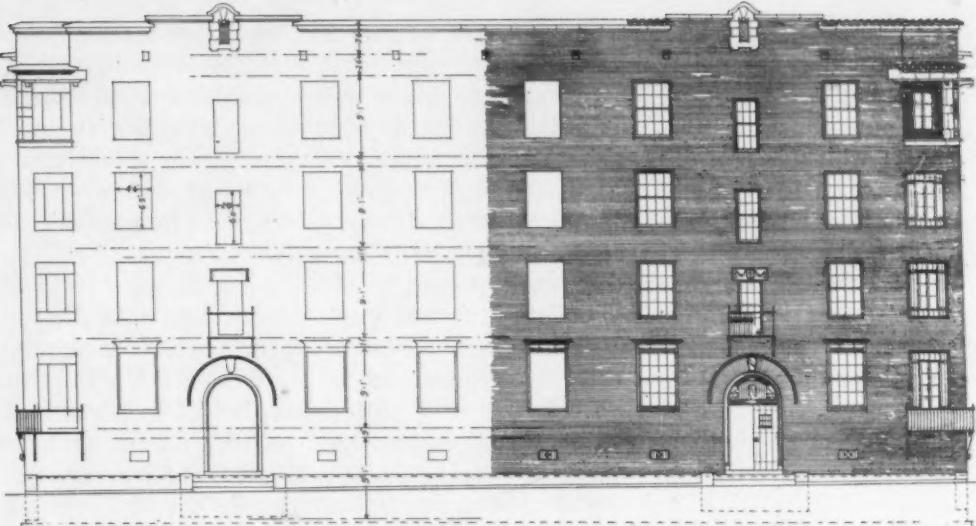
PERSPECTIVE VIEW OF TYPICAL UNIT

GARDEN APARTMENTS, JACKSON HEIGHTS, QUEENS COUNTY, NEW YORK CITY

ANDREW J. THOMAS, ARCHITECT

lack of common labor, due to diminished immigration, it is not to be expected that the cost of labor can decline; and as material stocks are low and must be replenished by the employment of high priced labor, it is reasonable to expect that new supplies of building material will cost more in future than they have in the past.

There is at present an abnormal shortage of houses for people to live in, the industrial expansion that is being planned in practically all centers will insure the demand exceeding the supply for a number of years to come, and with the probable increased cost of later buildings there is assurance that good rental returns can be had for a sufficiently long time to make any adjustment to suit new conditions that may arise in the future a matter of comparative ease.

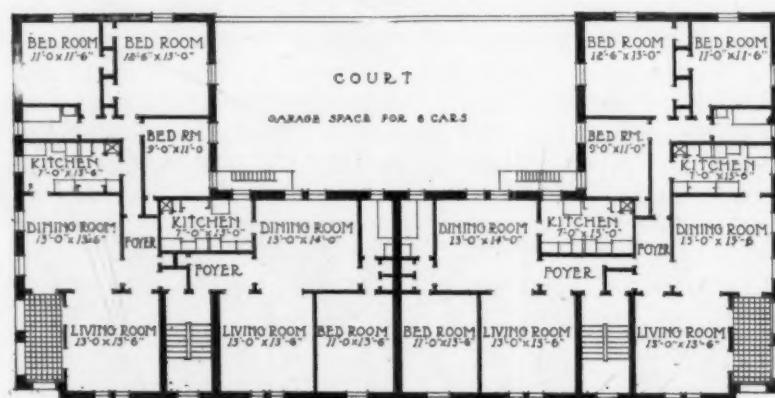
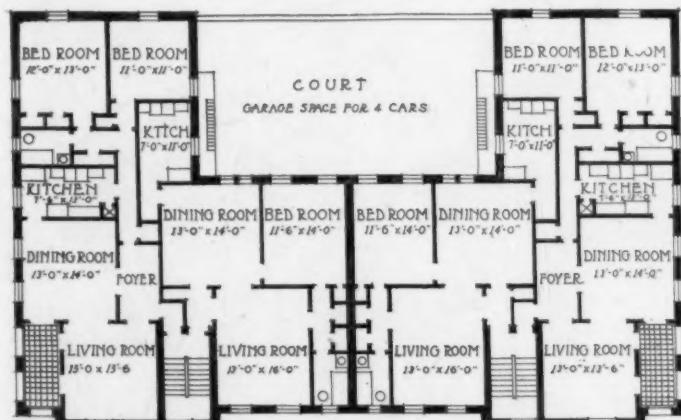
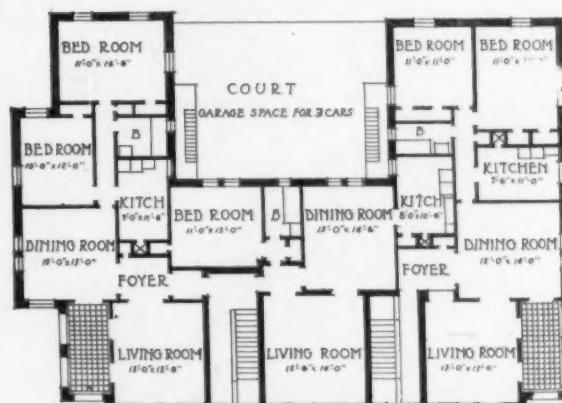


Street Elevation of Typical Unit

These are the deductions which have made it seem desirable to The Queensboro Corporation to build immediately, and their action which is a constructive aid in the solution of the housing problem, proves that it is not new theories that are needed necessarily to relieve the situation, but the ability to determine investment possibilities and having reached a decision fairly, to proceed on the basis of it.

This group now under construction will comprise sixteen apartment houses four stories high with basement, located on a city block 200 by 500 feet in area. The location is in Queens County about twenty minutes from the Grand Central District of New York City, by the new rapid transit lines which have made this portion of the city available for living quarters of discriminating people who can afford to pay fair rentals.

Study of the block plan will show a new feature in the planning of such buildings. They are arranged as detached

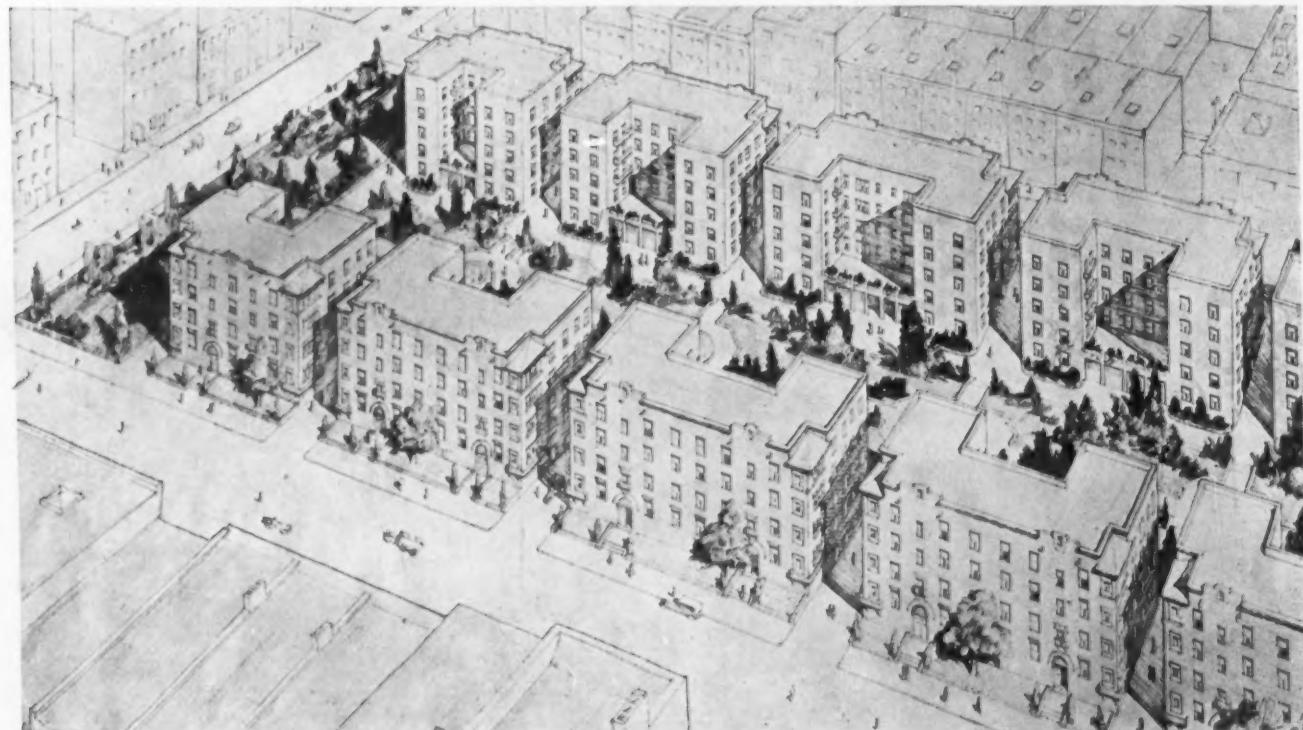
Typical Floor Plan of 120 Foot Unit  
8-6 Room and 8-4 Room Apartments, Area 4266 Square FeetTypical Floor Plan of 107 Foot Unit  
8-5 Room and 8-4 Room Apartments, Area 4190 Sq. Ft.Typical Floor Plan of 83 Foot Unit  
8-5 Room and 4-4 Room Apartments, Area 3199 Sq. Ft.

and semi-detached houses with courts 15 feet wide between the units and a continuous open space in the center of the block 40 feet wide which will be planted as a garden. This provides with the side courts which serve also as automobile driveways, a system of block ventilation that is nearly perfect, and unknown to the usual apartment house development. The courts of the buildings themselves are made especially large so that each apartment is afforded ample light and air. It might at first thought seem extravagant to devote so great an area to courts, but the plan is based on careful investigations of building development and its return over a period of years. It has been recognized that light and air have distinct values that are worth striving for; an apartment in which all the rooms have cross ventilation and an unobstructed view of the outdoors enjoys advantages in the way of larger rentals, fewer vacancies and longer life than one having practically no cross ventilation and an outlook from many of the rooms into a dark walled up court. Further study of the plan will indicate such an economy of arrangement and consequent reduction in the cost of building as to largely offset any possible loss of revenue from lack of utilizing the area to the legal limit.

The plan is of a closely contained arrangement, all rooms being within a short radius of the common center, thereby eliminating waste space and affording separate grouping of the living and sleeping rooms in a manner generally found only in private houses. There are no rear apartments in any of the buildings, the living rooms are at the front and so far as possible

the bedrooms are given corner locations facing the gardens with light on two sides. The stairways are placed in central positions occupying the least possible area, involving the minimum fire wall construction, and giving access to the floors in such manner that no long halls are necessary to reach the various rooms. This one feature of planning has in it possibilities of lessening the cost of construction sufficiently to permit apartment buildings to be erected today at a cost nearly the same as that of buildings of the older type erected before the war.

The architect of these buildings has given a great deal of study toward effecting economical apartment house planning and two plans for five story non-elevator apartments each occupying a hundred foot square corner lot are reproduced to afford definite comparison of his results with the type that previous to the war was erected in large numbers by speculative interests. The difference in cost of erection of these two buildings is \$20,000 in favor of the plan of the newer type, from which a building will soon be erected at an estimated advance of only 10 per cent. over the pre-war cost of a building of similar accommodations but of the old type plan. This low cost is obtained through the saving of area by reason of more compact planning and an economic development of the land. The new plan shows a total area of 6760 square feet with 32 large and well grouped rooms to a floor, against 7900 square feet in the other plan employed to produce the same number of rooms and of smaller dimensions. The cubic contents thus saved, considering the height of the buildings 60 feet,



Bird's-eye View Showing Courts and Interior Treatment of Block

figured at 30 cents represents a saving of \$20,646, and the addition of this area to the courts provides better light, ventilation and outlook that immediately increase the rental value, thereby insuring larger returns on a smaller investment. Careful comparison of these plans will prove that the best investment is not made when the legal maximum area of the lot is built upon, for the cost of excess construction more than offsets any possible greater return.

It is on these principles that the buildings of The Queensboro Corporation have been planned. Every effort has, furthermore, been made to simplify construction with the purpose of keeping the cost moderate. The cubic cost figure of 32 cents proves that this has been done, for in comparison with 27 cents, the figure on similarly finished apartment buildings erected early in 1917 by the same corporation, the advance is less than 20 per cent. The cost per room approximates \$1000 and the rentals will be based on a monthly charge of \$15.00 per room exclusive of the bathroom.

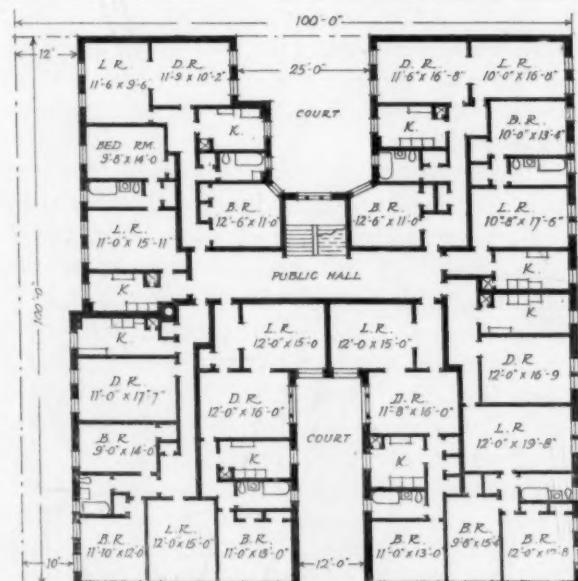
The construction is second class with wood framed floors, exterior walls are twelve inches thick of hard burned common red brick, no face brick being used; a small quantity of Indiana limestone is used for trim at points where it will count in lending character to the facades; wrought iron balconies and grilles and a tile coping give further notes of interest.

The architecture is a modified type of Spanish Renaissance and is extremely attractive in its simplicity. The facades are devoid of unsightly fire escapes, provision for them being made in the courts. The bases of the courts are utilized for garages and

being depressed below the level of the gardens, the attractiveness of this feature is in no way impaired. The buildings are set back from the building lines, and terraced to eliminate the unsightly excavations necessitated by the tenement house law. The garden level is lower and this provides ample light for the janitor's quarters in the basement. Heating is by steam from a single plant in each house; in the semi-detached buildings provision is made for dividing the plant into two sections in the event of the units being owned by different people. Hot water will be furnished each apartment from a central generator in each building.

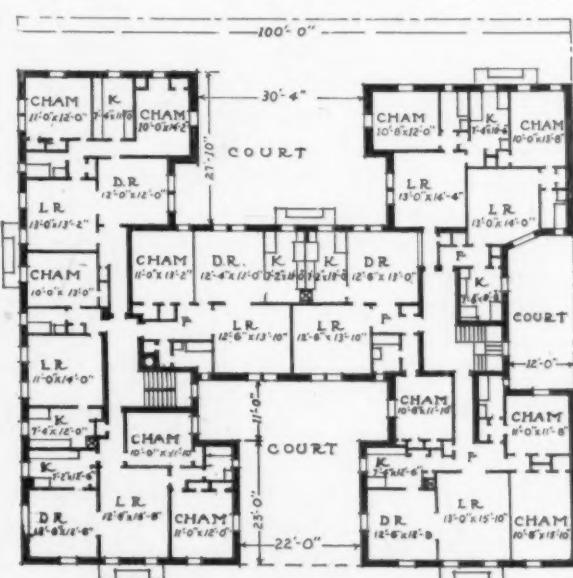
Bathrooms are to be tiled and equipped with modern plumbing fixtures, tubs will be built in and showers provided over each. The interior finish will be white enamel and all floors of oak. The loggias, which are a new feature in New York apartment houses, are screened from the living rooms by French windows, and the outer openings enclosed in glass and movable shutters, the floors are tiled.

A feature of the operation will be the encouragement of community life, which is usually found only in suburban towns, and perhaps attempted here for the first time in an apartment house section. The provision of playgrounds, tennis courts, a golf course, and garden space on adjoining land, with activities of a religious and social character have been an especial attraction to tenants of this corporation's present buildings. New efforts along co-operative lines are developing; the latest of these is the movement toward collective ownership of apartments as a means of reducing the cost of living, which is being considered in relation to this new group of buildings.



Typical Old Type

2-5 Room, 4-4 Room, and 2-3 Room Apartments per Floor  
Total 32 Rooms in Area of 7900 Square Feet



New Type. Andrew J. Thomas, Architect

3-5 Room, 2-4 Room and 3-3 Room Apartments per Floor  
Total 32 Rooms in Area of 6760 Square Feet

Comparative Floor Plans for Apartment House on Corner Lot, 100 x 100 Feet

## EDITORIAL COMMENT

HOSPITAL construction in the United States has not escaped, any more than other types of building, the restrictive measures which have resulted during the course of the war in creating an abnormal shortage of buildings. The gradually rising prices through 1914, 1915 and 1916 tended materially to discourage the building of hospitals and with the advent of the war, government restrictions stopped all hospital construction, save that for the military and naval forces. The government work was largely temporary, designed to fit only military needs, and cannot be expected in any way to contribute relief to civilian needs which have increased with the growth of our population. We have, therefore, to look forward to a new era of hospital construction of large extent to meet the demand that already exists.

While it can be safely said that the government hospitals have contributed little if anything new to the knowledge of hospital planning, changes of important character may be expected in the ideals and conduct of the medical profession from the participation of large numbers of civilian physicians in government service, and these changes will naturally be reflected in the hospital buildings of the future. The government service was made up of a combination of specialists; physicians in entering the service, even with quite extensive general experience, were examined as to fitness in individual subjects and on the results of such investigation, assigned to the particular phase of practice they were best fitted to perform. This has developed a strong tendency toward group relations in the treatment of the sick. No one doctor is able to stand alone, capable of giving equally expert advice in the many divisions of modern medicine; he perfects his knowledge in one or two special phases of practice and co-operates with others when conditions beyond his range of practice arise.

The knowledge acquired during the war of working harmoniously and effectively in large groups supervised by central administration will be carried into civil life and applied with benefit to many institutions. Because of the high cost of all labor, the greater expense connected with building and all factors entering into modern transactions, the general tendency will be to carry out all manner of operations on a larger scale than formerly in order to maintain overhead costs at a nominal figure.

The demands of the future will particularly affect the hospital. There will undoubtedly be fewer specialized hospitals; the tendency will be toward larger and general institutions. Thus it will evolve upon architects to consider the planning of these buildings in the light of affording co-operative service in such a manner that different types of disease can be treated in one group of buildings with a central location for those features necessary to all departments, and the separate functions so distributed that easy and quick

communication can be had with one another. The various hospital units must be designed to function in an orderly manner, just as the individual specializing physicians combine their efforts to provide complete medical service.

### WALLACE CLEMENT SABINE

WITH the death of Wallace Clement Sabine on January 10, 1919, a man known to architects throughout the country for his research and valuable contributions to the science of architectural acoustics was removed from a busy and useful life. His preëminence in architectural acoustics, his favorite field of study, was beyond dispute. It was constantly his aim to give to the architectural profession the benefit of his research, and many important buildings testify to the expert knowledge he had of the subject.

He was born in Richwood, Ohio, June 13, 1868. He entered the preparatory department of the Ohio State University at the age of twelve, graduating with the degree of A.B. in 1886, at the age of eighteen. He was a graduate student at Harvard University in physics and mathematics for two years, following which he became an instructor in the former subject. In 1895 he became assistant professor of physics, and in the same year began his work in architectural acoustics. In 1905 he was made full professor at Harvard and in 1906 assumed the duties of Dean of the Graduate School. In 1916-17 he was exchange professor in France, where he lectured at the Sorbonne on acoustics. Returning to this country in the fall of 1917, he gave his services to the government and was made Director of Technical Information under the Board of Air-Craft Production.

To those architects who knew him, the following lines from an appreciation by Edwin H. Hall in the *Harvard Graduates' Magazine* will recall his engaging personality.

"Any time for the past year or two, looking upon his spiritual, still youthful face, and noting the smiling obstinacy with which he followed a course of toil that must end his life too soon, one might be tempted to think of him as some elfin being that had taken human form in benevolent caprice, but was now planning departure and adventures new. Not that he ever, save in the very ecstasy of pain and weakness, showed any symptoms of world-weariness. He was full of affection, full of the zest of life, full of plans for future years. He has told me that he never enjoyed his work of teaching more than during this past fall, so trying to most of those who remained in academic life, and he had been looking forward joyfully to the prospect of resuming his work of research, especially that part of it which was to be carried on in the special laboratory built for him by his friend, Colonel Fabyan, at Geneva, Illinois."

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*From a very long list,  
we select some representative jobs:*

<b>New York State Seaview Hospital</b>	Architect, R. F. Almirall, New York City
<b>Municipal Tuberculosis Sanitarium</b> <b>Chicago</b>	Architects, Otis & Clark, Chicago
<b>Municipal Tuberculosis Sanitarium</b> <b>Milwaukee</b>	Architects, Robert Messmer & Bro., Milwaukee
<b>Michigan Epileptic State Colony</b> <b>Wahjamega, Michigan</b>	Architect, W. E. N. Hunter, Detroit
<b>S. E. Hospital for Insane</b> <b>Madison, Indiana</b>	Architects, Foltz & Parker, Indianapolis
<b>Wisconsin State Hospital Farm Colony</b> <b>Wauwatosa, Wis.</b>	Architects, Robert Messmer & Bro., Milwaukee
<b>Washington State Hospital for Insane No. 1</b>	Architects, Heath & Gove, Tacoma, Washington
<b>Washington State Hospital for Insane No. 2</b>	Architects, Heath & Gove, Tacoma, Washington
<b>North Carolina School for Blind</b> <b>Raleigh, North Carolina</b>	Architect, F. K. Thomson, Raleigh
<b>U. S. Hospital, Panama Canal Zone</b>	Architect, War Department
<b>U. S. Hospital, Aviation Buildings</b> <b>Hampton, Virginia</b>	Albert Kahn, Architect, Detroit

While this list might be extended almost indefinitely, the above is fairly typical as to the character and location of buildings where our various patterns of tile have been used. These have been in various colors and shapes, according to architectural requirements and we have also furnished on many hospital buildings our Tile Slabs for flat roofs.

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*Ludlow & Peabody, Architects*

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## FUTURE BUILDING OPERATIONS

will make it necessary for architects to exercise greater care in determining relative values of building materials than ever before. Construction costs will be the large factor in the consideration of the many building projects which the long period of building stagnation has made immediately necessary. Hotels, apartment houses and schools are needed in all centers. These buildings require

dignified architectural treatment and yet they must be kept moderate in cost.

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Terra Cotta Panel on Apartment House, 86th Street and Amsterdam Avenue, New York. Schwartz & Gross, Architects

A Composite Photograph is not exactly like any one but a little like each one of the many.

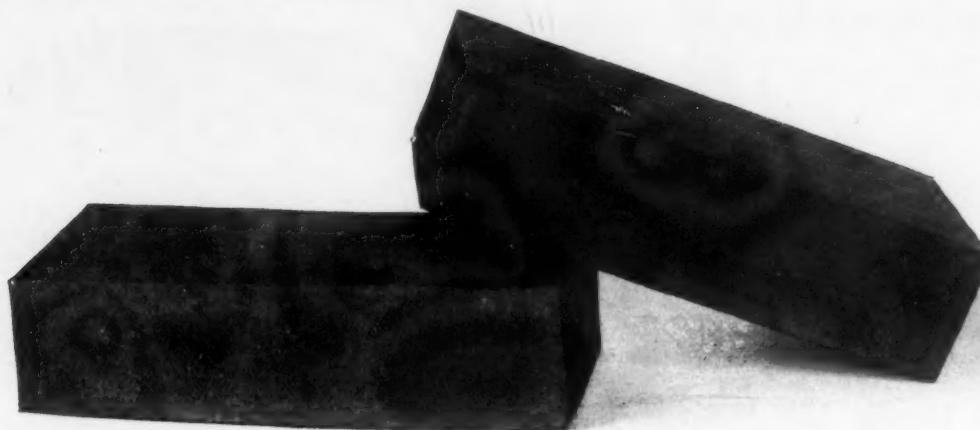
A Modern Building is like it in that it has something of the individuality and enthusiasm of each one of the workers who have honestly wrought on it.

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The only way to KNOW the beauties of these brick is to SEE them. Very likely we have some of them laid up in a building conveniently near you. We shall be pleased to send you a list of these buildings in YOUR vicinity. Upon request also we shall be pleased to send samples of CLOISTERS, or any other of our specialties.

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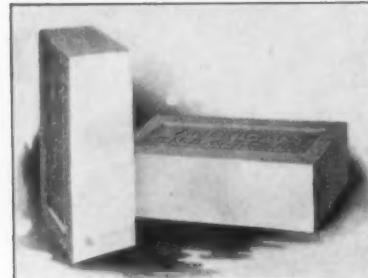
### Old House Mottoes

There is a revival in the custom of welcoming mottoes once so prominently displayed by the builders of Old Europe. These mottoes were on walls, over doors, lintels and hearths. Many of them—quaint and warm in greetings, still stand on the castles, palaces, manses, abbeys and cottages and have come to us down through the centuries. One of these is shown in the accompanying picture—the second of a series which appears in this space every month. Should any architect or builder be interested in these "Old Mottoes" we shall be pleased to send an advance set of the entire series upon request.



Alex I raise my Shield, the pelting Rain  
And rattling Hail assault my Slope in vain.  
The burning Sun, the Weight of Winter Snow  
Alike I scorn,—then rest secure below.

Sketched from a photograph  
in Allen W. Jackson's  
"Half-timber House"



Enameled Brick

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Chicago

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There is no doubt that architects, had they realized their wishes, would have stamped upon this country a higher average of building refinement.

A new era appears to be dawning—an era marked both by the financial ability of home owners to build better, and by this keener appreciation of the artistic as applied to home adornment.

Tiles, which for ages gave expression to the most noble decorative dreams, are more firmly coming into their own. And the true architect, whose artistic sense must be combined with practical ability to make him worthy of his profession, will be no less than thankful that this change in the tastes of the American public is taking place.



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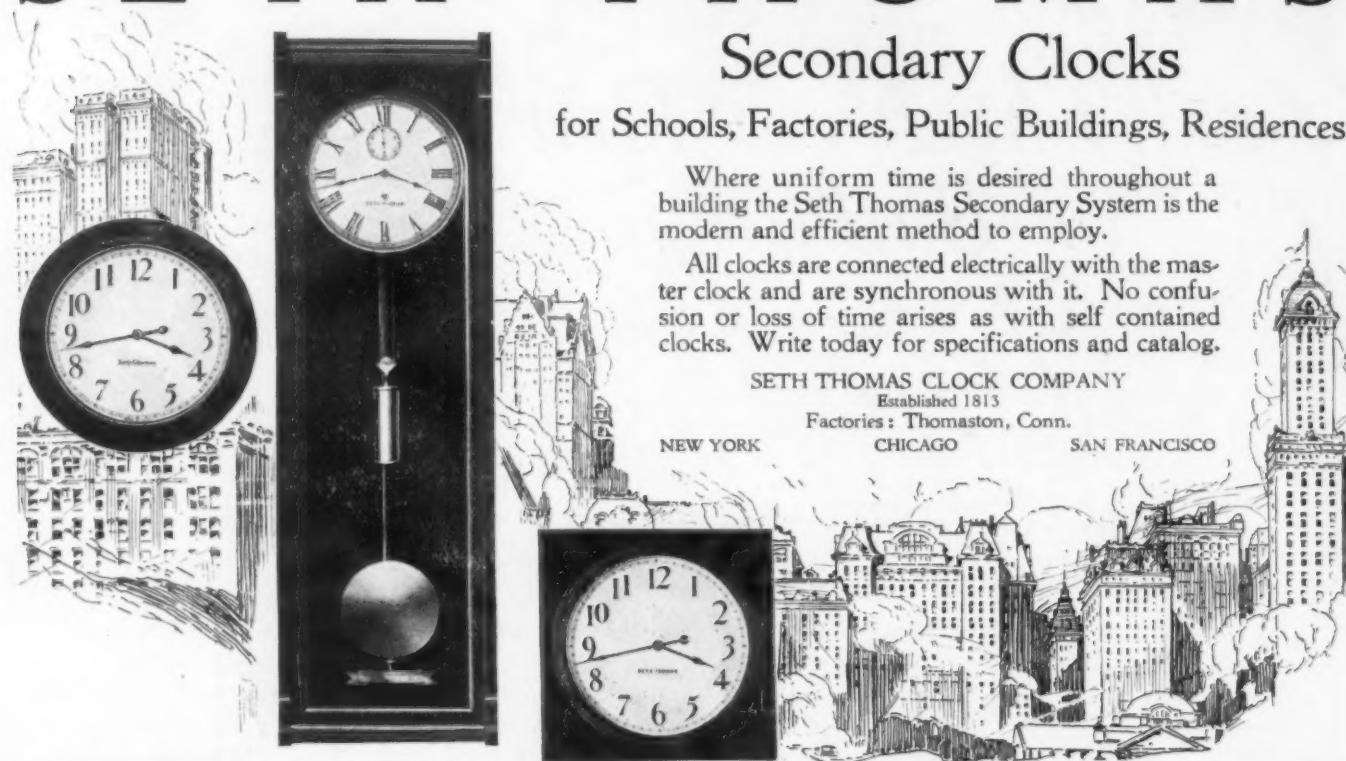
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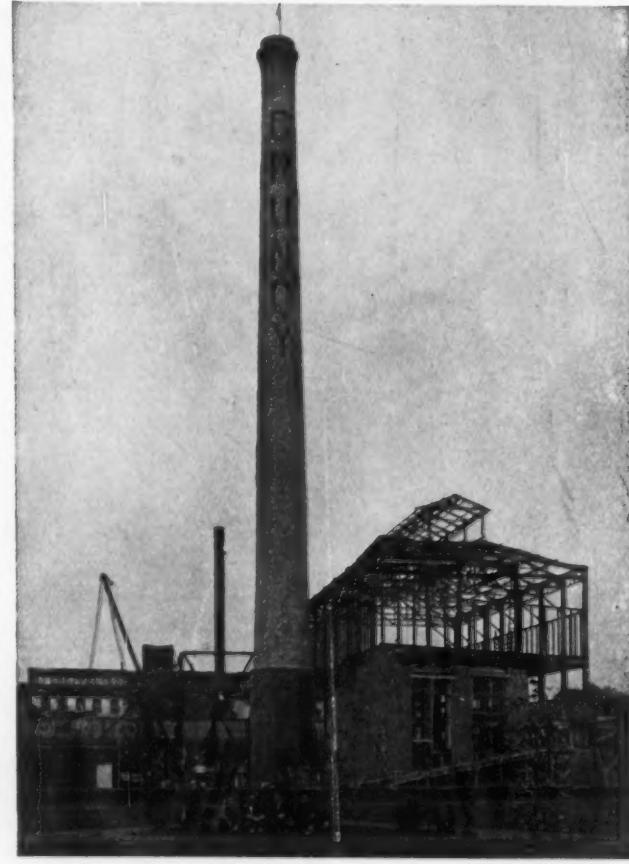
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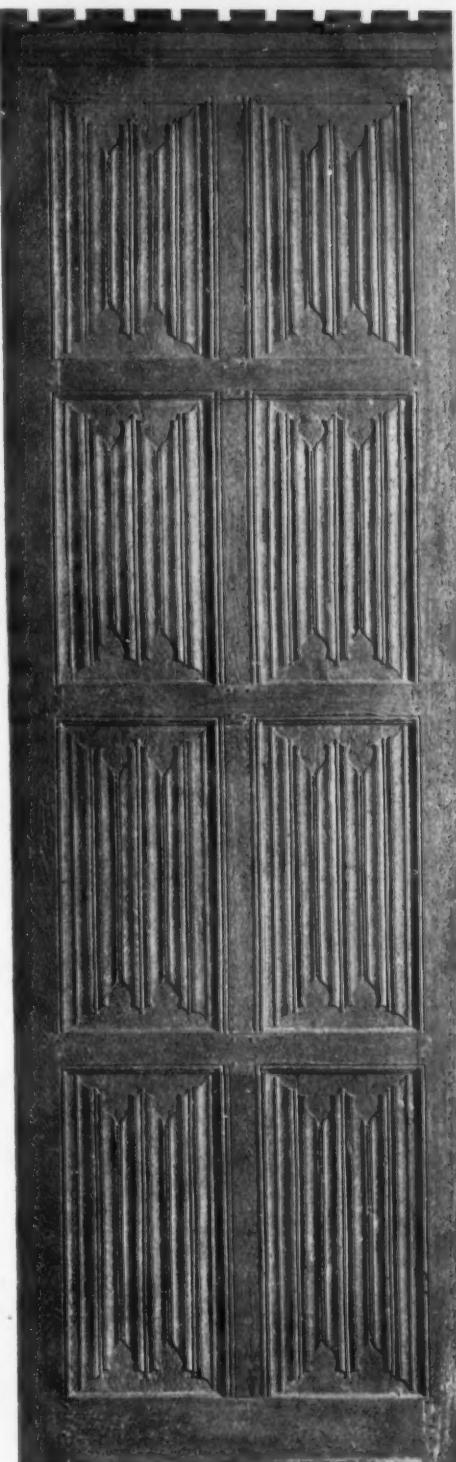
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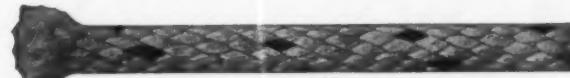
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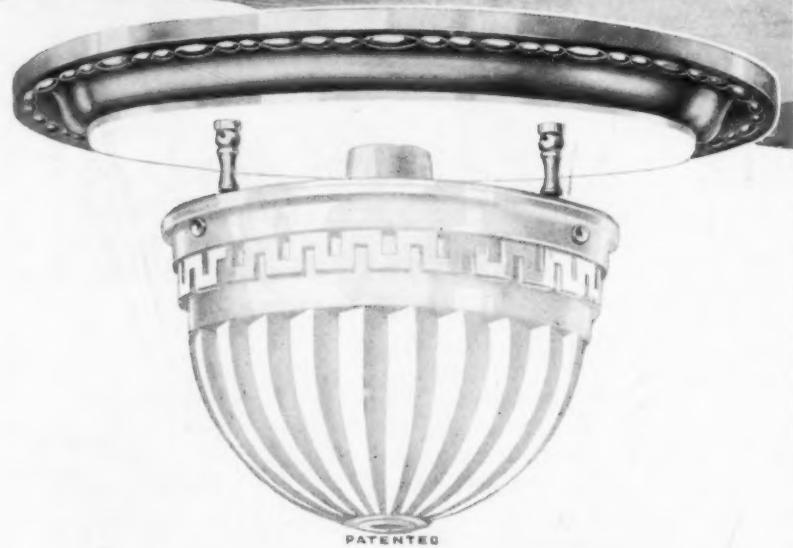
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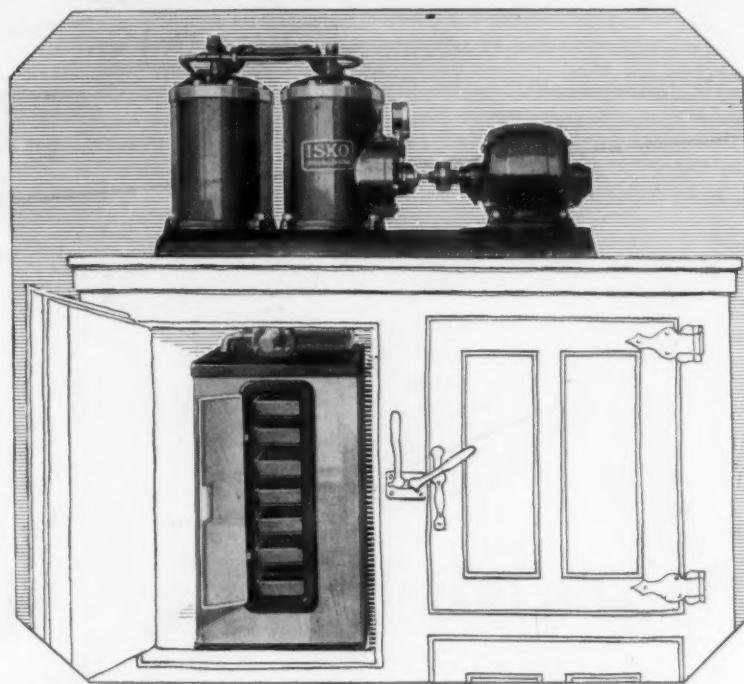
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Yours truly,  
STROMBACH & MERTENS,  
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**A**N ENGINEERING and Architectural firm which does big things in New Jersey has written us regarding its experience with Bishopric Sheathing on 50 houses it built in connection with the Mesa Housing Project at Irvington, N. J. Read the letter. It is more significant than anything else we could say about this modern Sheathing Board.

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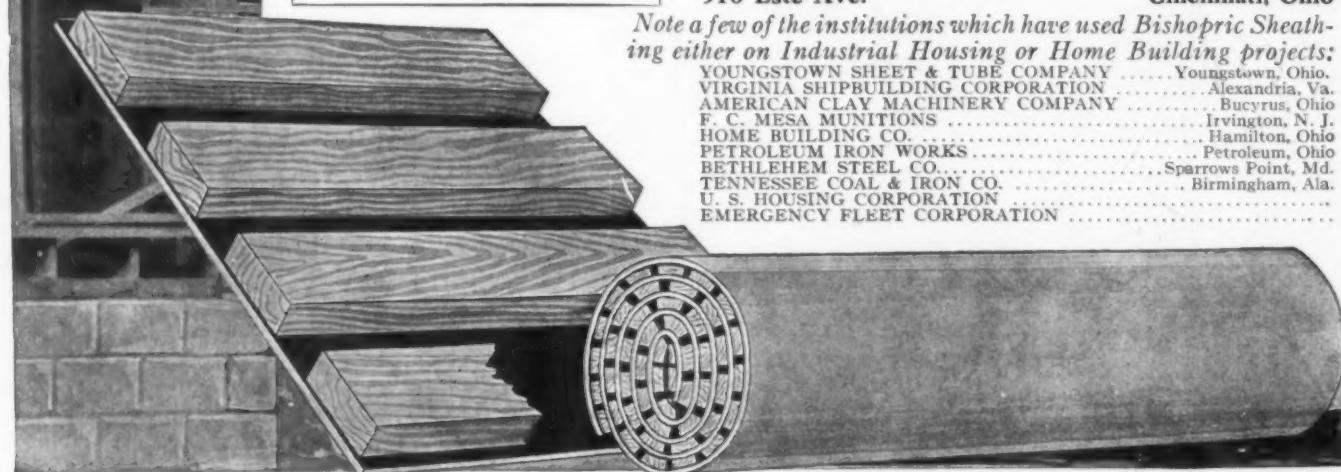
There are no knot-holes, or gaping joints, or widening cracks due to shrinkage. Mastic and fibreboard are elastic enough to take up any expansion and contraction. Nailed firmly to the building, it gives the same advantages procurable by sheathing with solid board.

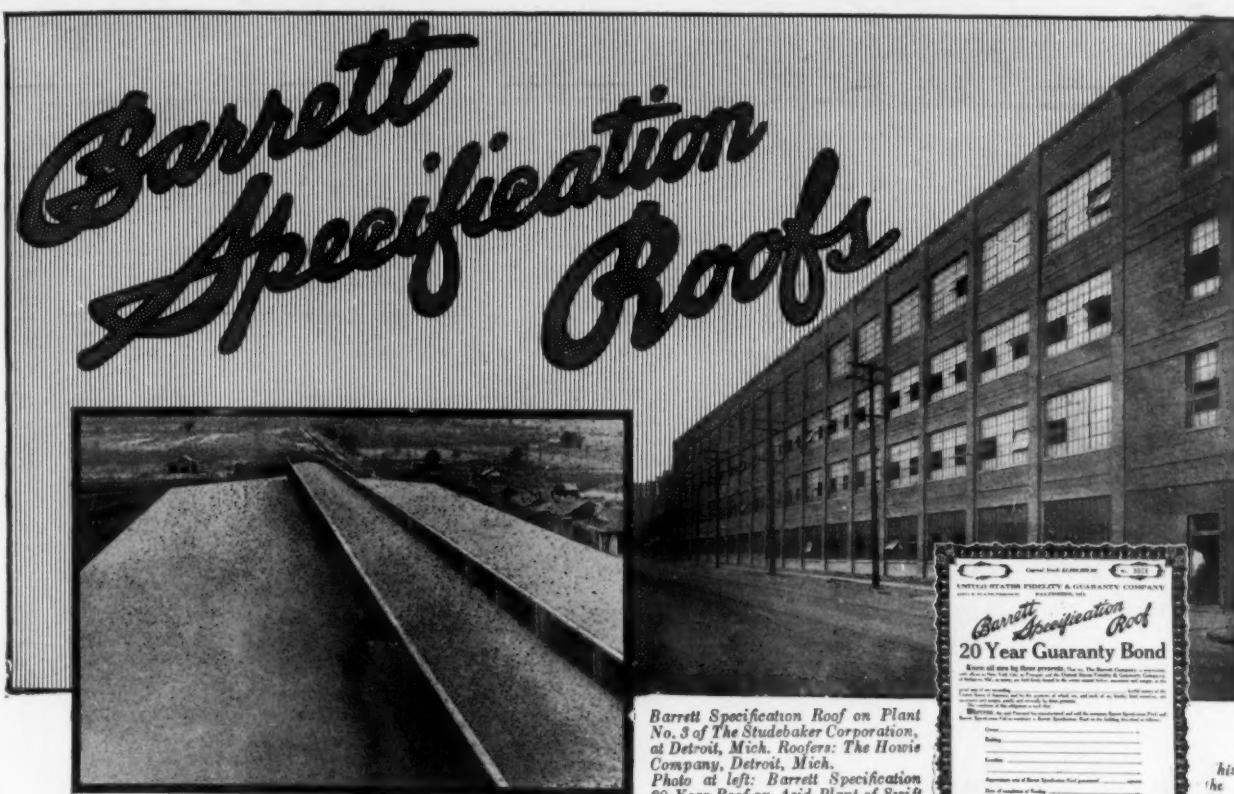
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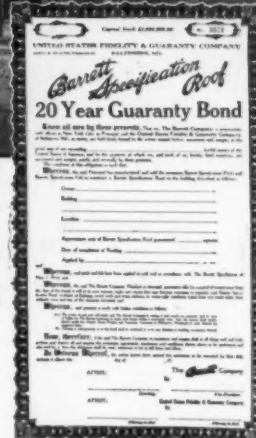
*Note a few of the institutions which have used Bishopric Sheathing either on Industrial Housing or Home Building projects:*

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Barrett Specification Roof on Plant No. 3 of The Studebaker Corporation, at Detroit, Mich. Roofers: The Howie Company, Detroit, Mich.  
Photo at left: Barrett Specification 20-Year Roof on Acid Plant of Swift & Company, Harvey, La. Roofer: Kracke & Flanders Company, New Orleans, La. General Contractors: Huggar Bros., Montgomery, Ala.



## Cover Your Investment with a 20-Year Guaranty Bond —

Every one knows that a structure of brick and steel and concrete will endure for a generation and more.

But how about the roof that covers the structure?

Frequently that is not only an unknown quantity but a *liability* rather than an *asset*.

It is a short-sighted and costly policy to put a *poor* roof on a *good* building.

As one of the oldest and largest manufacturers of materials used in constructing roofs, we have done our part to make *all* roofs good roofs.

Years ago, for that reason, we induced the leading architects and engineers to unite in the adoption of The Barrett Specification as a satisfactory standard specification.

Now we go a step further by sending our Inspectors to check up on the construction, and if they find that The Barrett Specification has been properly complied with, we will, without charge, issue a 20-Year Guaranty Bond *exempting the owner from all further expense for repairs or up-keep on that roof for twenty years*.

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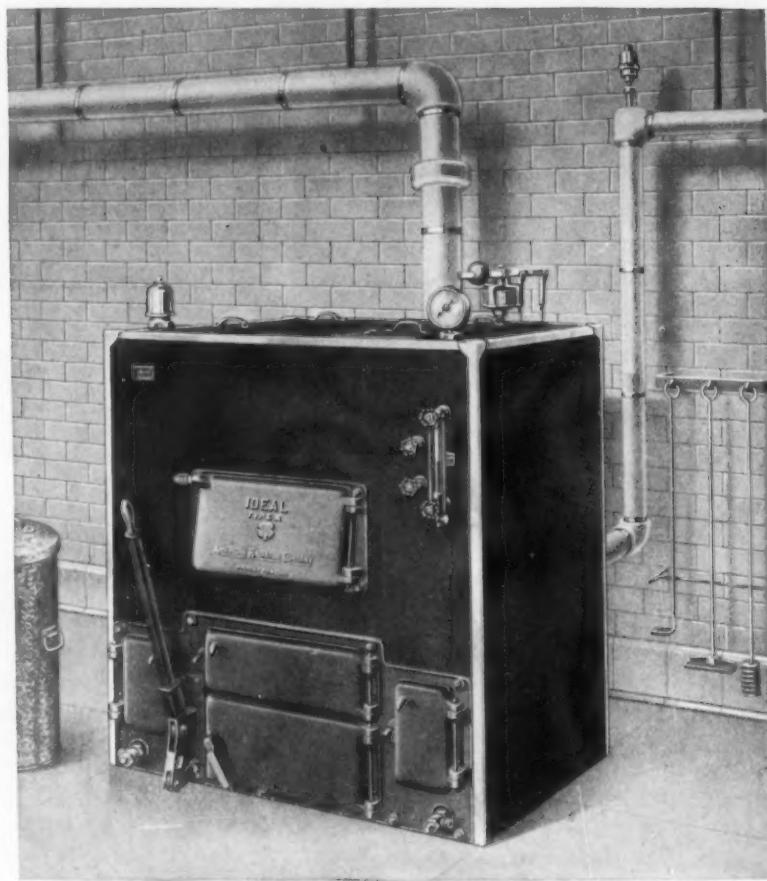
*A copy of The Barrett 20-Year Specification, with roofing diagrams, sent free on request.*

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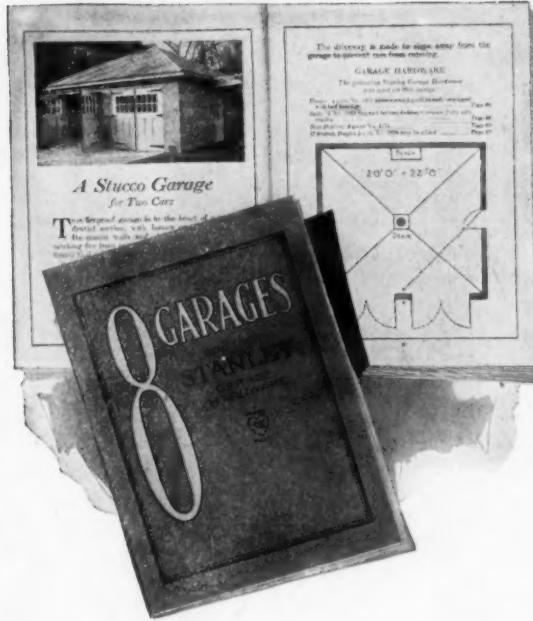
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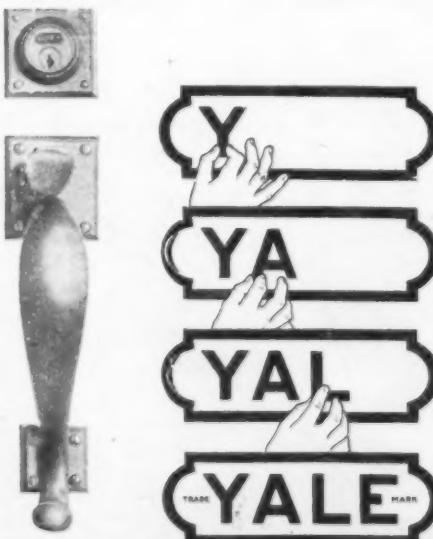


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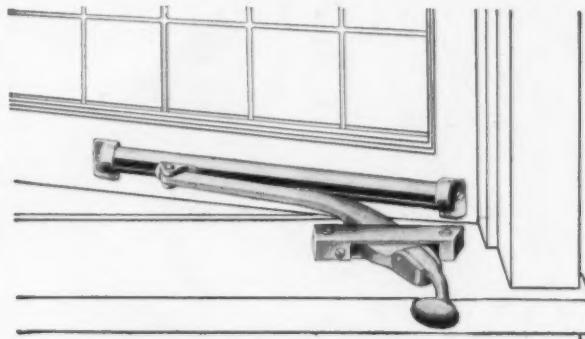


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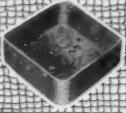
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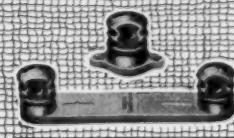
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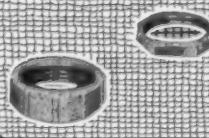
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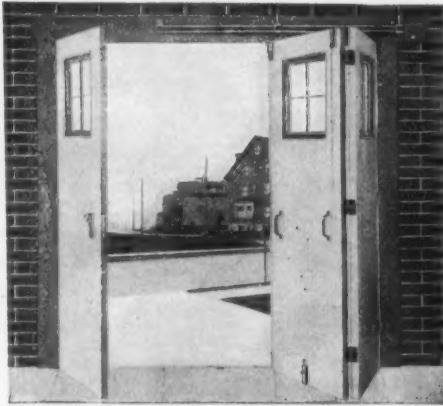
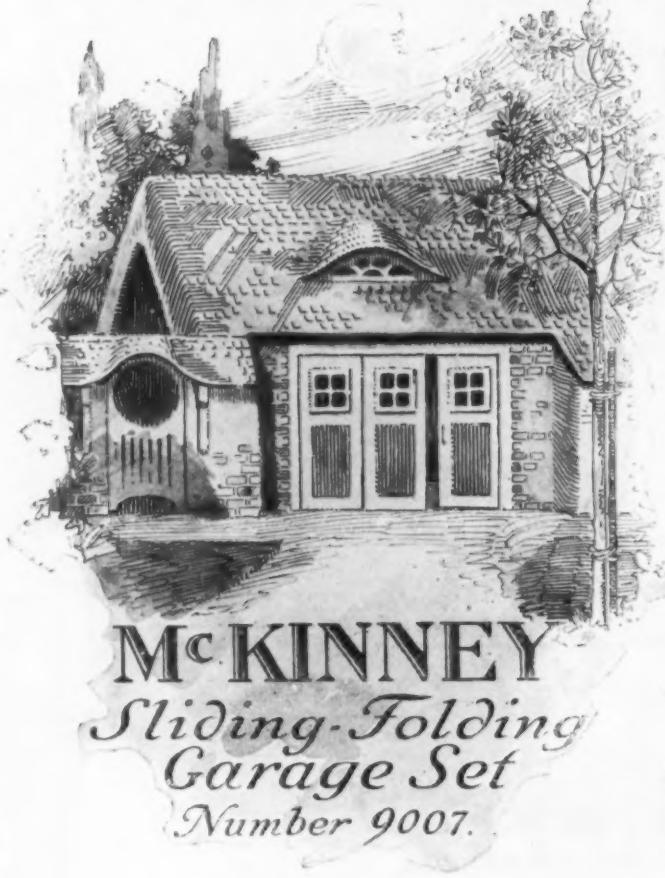
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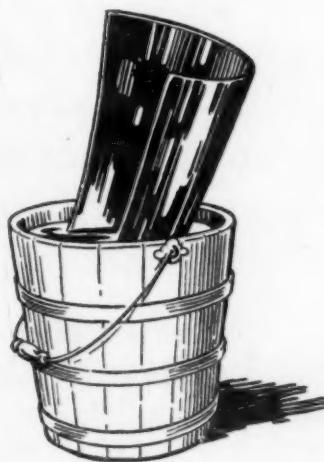
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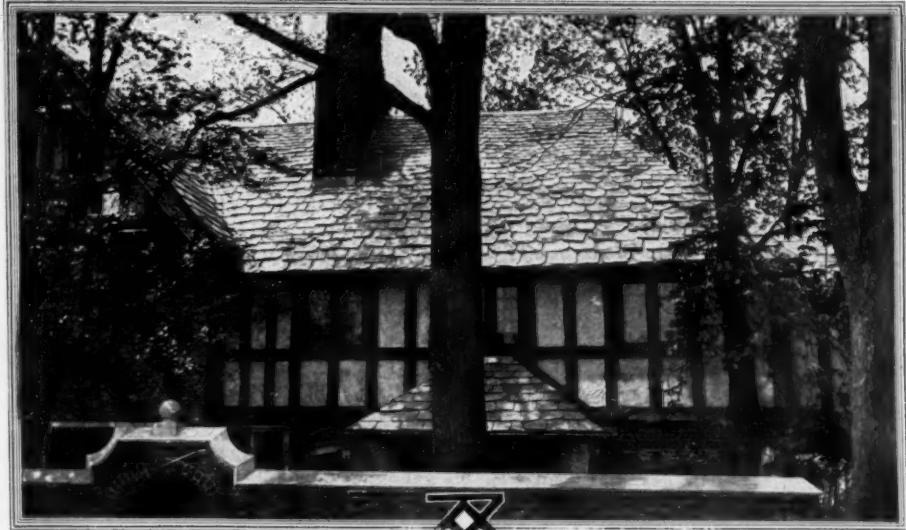
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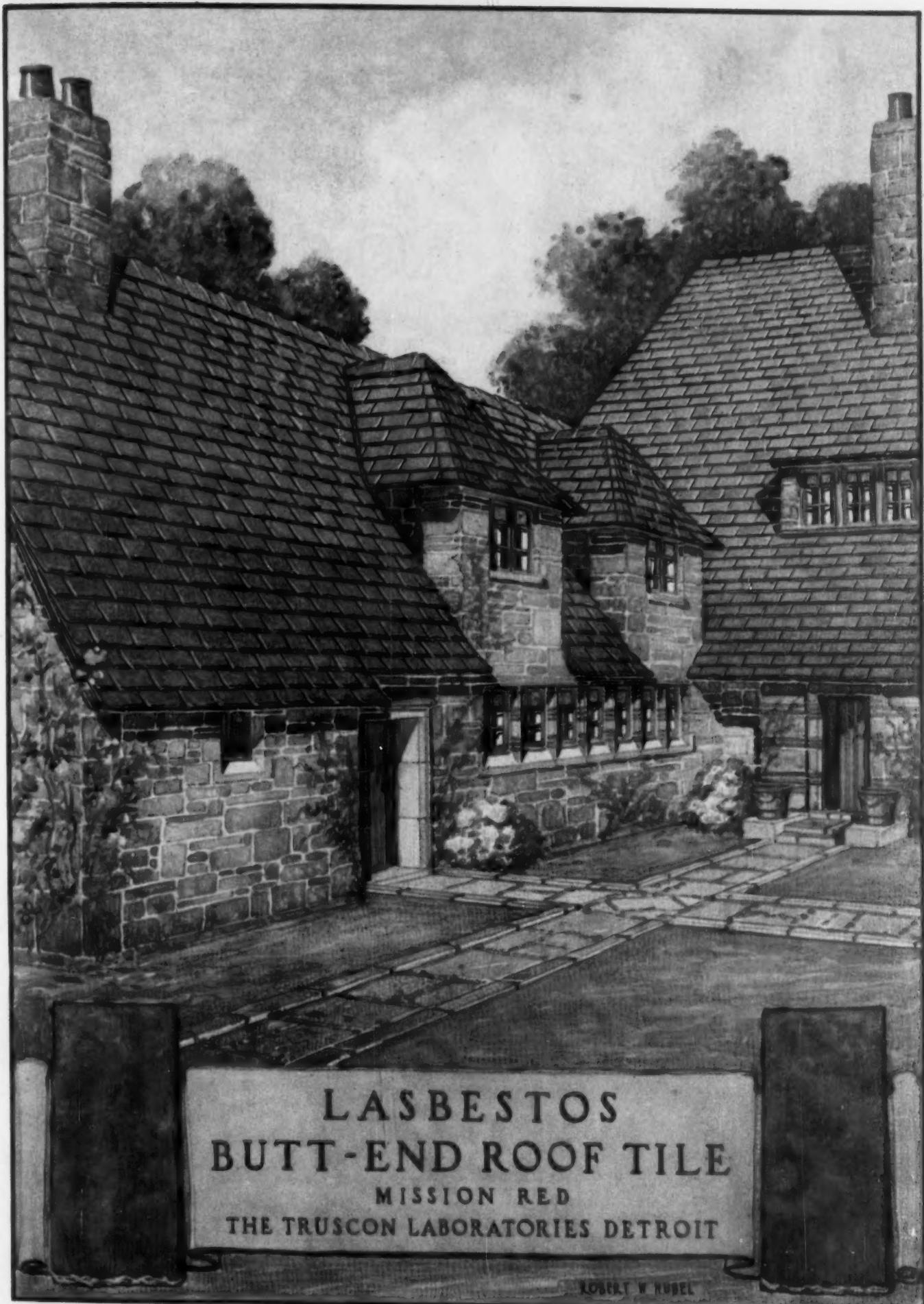
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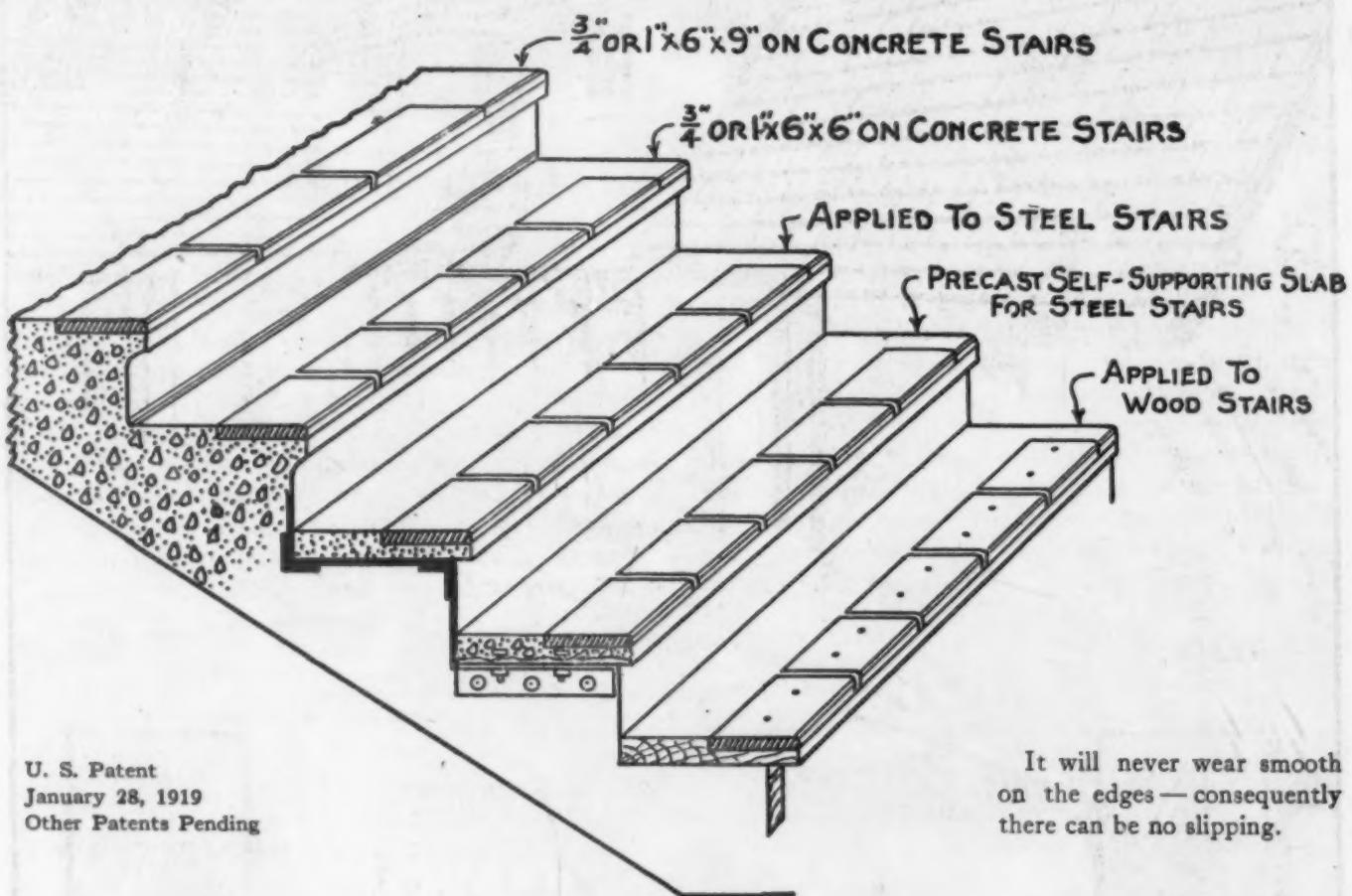
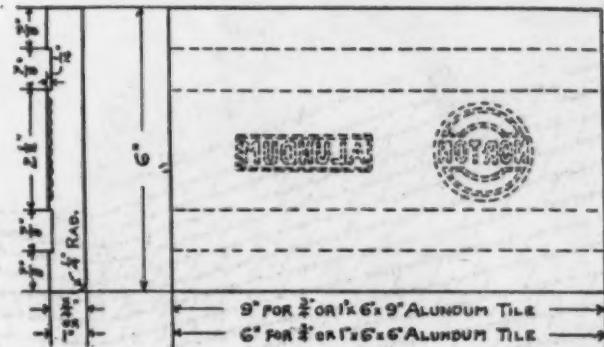
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Baltimore

# ECCO Dependable Insulated WIRE

ECCO advertising stimulates public interest in the true values of electrical installations. It drives home the value of first quality materials—of competent, well-paid workmanship. Because of such advertising as this, the public accepts with greater readiness, specifications and bids for good materials throughout, and is more willing to pay for skill and time in making installations.

The reputation of ECCO WIRE has been established by many years of progressive development in manufacturing facilities, in experience and in strict adherence to the highest standards.

## *Insulated Wire is a Power Distributor*

*This advertisement  
appears in  
Literary Digest,  
System, Factory  
Manufacturers Record  
and other  
national mediums.*

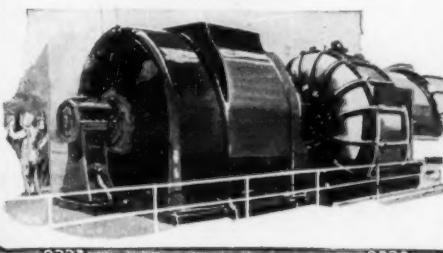
THE significance and importance of the steam-pipe in a steam power plant is appreciated and accepted immediately by everyone. The even greater importance of insulated wire in the electrical system is so much less obvious that it is not so readily recognized.

Insulated wire provides the outlets for the energy developed in the central station. It is a power carrier, a power distributor which adds to your plant all the advantages of an individual power generating system, with unlimited capacity and 24-hour operation—all the advantages, *less* the overhead, the wastage and responsibility of steam power plant maintenance.

But more than this—insulated wire determines the economy and dependability of your electric power.

## ECCO Dependable Insulated WIRE

THE ELECTRIC CABLE CO.  
10 EAST 43rd STREET NEW YORK CITY  
*Makers of Ecco Wire for every purpose where rubber-covered wire is used*



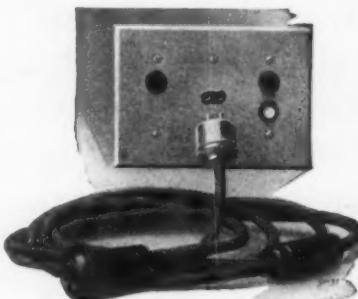
*ECCO Advertising  
is designed to sell wire  
by constructive work  
for the electrical  
industry. If you use  
ECCO, ECCO pub-  
licity works for you.*

## The Salem and Brooklyn Hospitals

described and illustrated in this issue are both equipped with

## BRYANT SILENT CALL SYSTEM

159 stations in the Brooklyn Hospital and 158 stations in the Salem Hospital provide reliable, instantaneous means for patient or attendant to call for assistance. At the same time the call is made, a signal light over the door of the room gives an indication to passing attendant; the call is also indicated by a signal light at



A calling station of the Bryant Silent Signal System which operates with entire safety direct on regular lighting circuit (110-125 volts). Calling Stations can be made to include a variety of convenient outlets, for portables, fans, etc.

the nurses' station and, if desirable, in the office, so that ample opportunity is provided for prompt service and checking of answer to the call.

Hundreds of other institutions throughout the country have installed over 10,000 stations of the Bryant Call System.

*Ask for a copy of our bulletin.*

## THE BRYANT ELECTRIC COMPANY

BRIDGEPORT, CONN.

NEW YORK

CHICAGO

SAN FRANCISCO

With  
"H & H" No. 3087  
Shutter-Door  
Receptacles



### Plug Through the Rug

Your clients, who are having indirect lighting fixtures installed in their homes, will probably have no convenient place in the dining room to connect the percolator, toaster or chafing dish.

Specify some No. 3087 "H & H" Receptacles for them. These can be installed under the rug. Small holes for the prongs can be made in the rug by spreading apart the weave.

If required, Plugs with extra long fingers can be furnished.

The Plug used with this Receptacle is very durable, being enclosed in a metal cap, finished in Bauer Barff, and presenting a very neat and attractive appearance.



The Hart & Hegeman Mfg. Co.

HARTFORD, CONN.



## PROMETHEUS

Electric Plate and Food Warmer

*More than a convenience —  
a necessity in the modern home*



### BUILT TO ORDER

Practically constructed to serve all building conditions and architects' specifications.

Simple—safe and efficient—absolute cleanliness assured by dry heating system—no moisture can precipitate on food or dishes.

*Send for illustrations and  
specification of construction*

Manufactured by

THE PROMETHEUS ELECTRIC COMPANY

511-513 West 42d Street, New York City

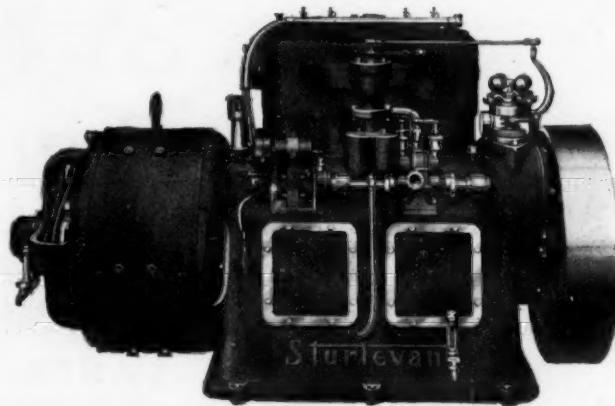
*Manufacturers' Agents please write*

## On the Western Front

the dugouts of our soldiers were often electrically lighted; the search-lights of the famous Marine Corps on the field were electrically operated. The source of these lights was the same.

**Sturtevant**  
1899 U.S. PAT. OFF. I

## Gasolene Electric Generating Sets



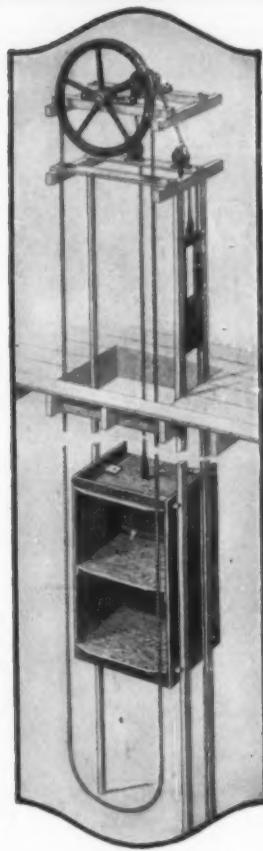
Sturtevant 5 K. W. Gasolene Generating Set

These sets were chosen for their reliability, simplicity of operation, absence of a cumbersome storage battery, the automatic controlling governor handling smoothly all variations in load.

These sets are built under the same engineering supervision, and in the same shop as are the Sturtevant Airplane Engines. They are ideal for country homes, yachts, clubs, small villages, and all isolated locations.

Our new Catalog is now ready for distribution,  
giving complete information. Ask for No. 255-B

**B. F. STURTEVANT COMPANY**  
HYDE PARK, BOSTON, MASSACHUSETTS  
And all Principal Cities



*Think  
of  
Dumb  
Waiters—  
Think  
of*

## SEDGWICK

For twenty-five years this name has expressed to architects, unquestioned superiority, unfailing service, and universal satisfaction.

We have specialized in the field of hand power Dumb Waiters, Invalid Lifts, Fuel Lifts, and Elevators for all purposes.

We make hand power outfits *only* and we guarantee them.

Special co-operative service for architects. Write for free catalogue and Service Sheet which answers all questions regarding specifications and installation.

### SEDGWICK MACHINE WORKS

*Specialists for twenty-five years*

151 WEST 15th STREET

NEW YORK



**"I never had to bother  
with them, so I don't know"**

said the custodian of New York's City Hall, when asked if the radiator valves in the building were Jenkins.

Of course, after investigation, they proved to be genuine Jenkins Valves—the same valves that were installed ten years ago. In explanation, the custodian said the radiator valves were the "least of his troubles," and that the reason he didn't know the make was because he never had had any occasion to fix them.

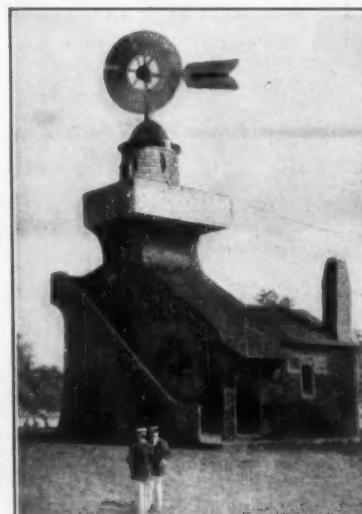
That's the story of Jenkins Valves in a few words—they are "trouble-free because they are made that way."

### JENKINS BROS.

New York Boston Philadelphia Chicago Montreal London

## Jenkins Valves

### A CORCORAN WINDMILL ON A COUNTRY ESTATE



solves the problem of water supply and adds beauty to the landscape.

Least in original cost—practically none for operation and up-keep—quietly working night and day it insures abundant supply for household, garden, lawn and stable or garage.

Architects have specified "Corcoran Mills" for over fifty years.

*Send for our book—"A. J. C."—today. It contains the names of prominent estates whereon Corcoran Windmills have been installed.*

**A. J. CORCORAN, INCORPORATED**  
No 762 Jersey Avenue  
JERSEY CITY, NEW JERSEY



*Field Museum of Natural History, Chicago  
Graham, Anderson, Probst & White, Architects*

## The Field Museum in Chicago

one of the monumental buildings in Chicago and the West,  
will depend for its extensive water supply system upon

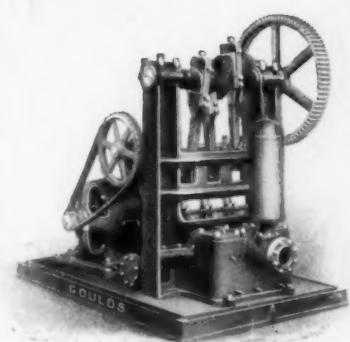
**GOULDS PUMPS**  
FOR EVERY SERVICE

As is usual in important work Goulds Pumps were specified because each pump is guaranteed satisfactorily to perform its service. Two Fig. 1696, 5x8, Form A Drive Pumps handle the problem in this case. Write for Service Bulletin.

**THE GOULDS MANUFACTURING COMPANY**

*Main Office and Works: Seneca Falls, N. Y., U. S. A.*

Boston, 58 Pearl St.; Pittsburgh, 636 H. W. Oliver Bldg.; New York, 16 Murray St.; Philadelphia, 111 N. 3rd St.; Atlanta, 3rd Nat'l Bank Bldg.; Chicago, 12-14 South Clinton St.; Houston, 1001 Carter Bldg.



## In Hospital Buildings Removal of Ashes *Electrically* With the G&G TELESCOPIC HOIST

*With Automatic Gear Shifting Brake Device and Silencer*

G & G Telescopic Hoists are in use in some of the most prominent hospitals in the country including the famous Mayo Clinic at Rochester, Minn.

There are five models (three electric and two hand power) each designed for the expedient removal of ashes and waste either to sidewalk or directly into ash truck.

The model illustrated is electrically controlled—*one* man performing the entire operation of raising and lowering cans. Less noise — no muss — no banging cans — no waste of time and work.



*Model E—Electric. That part of Hoist and G & G Spring Guard Gates shown telescope below grade, and the G & G Sidewalk Doors lie flush with grade when Hoist is not in operation.*

Provide  
for the  
We have prepared several pamphlets of interest to architects.  
Please write for the one which interests you most:

Schools and Auditoriums

Apartment Houses and Hotels.

Railroad Buildings.

Handling Tires.

What G & G Model Shall I Use?

G & G Sidewalk Doors.

G & G Automatic Sidewalk Door Opening and Closing Device with Spring Guard Gate.

G & G Standard Ash Cans.

G & G Ash Can Trucks.

**GILLIS & GEOGHEGAN**

*Established 1866*

**544 West Broadway New York**

*SHERBROOKE, QUEBEC, CANADA  
AGENCIES IN PRINCIPAL CITIES*



*An Achievement in*  
**ELEVATORS**

*The Quality Product of a  
Responsible Organization*

In the K&H Gearless Traction Elevator the well known principle of using a slow speed, especially constructed motor as the essential driving element has been improved by the addition of the K & H Magnetic Cushion.

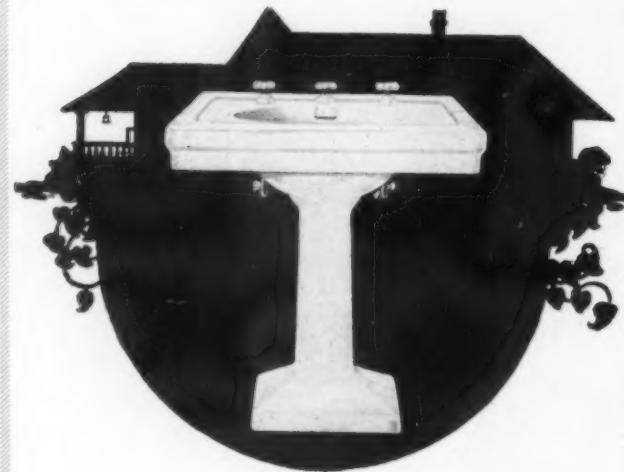
This device integral with the control apparatus now makes it possible to operate elevators with car speeds of 500 feet per minute and over with greater economy than has heretofore been possible.

Not only do the elevators possess a greater degree of ease and comfort in their riding qualities, but as a result of this improvement they are able to operate more quickly between floors and thus improve the service value of the elevator equipment as a whole.

Many experts who have seen the comparative results acclaim this latest K & H feature as the most notable of recent elevator achievements.

---

**KAESTNER & HECHT CO.**  
ELECTRIC ELEVATOR BUILDERS  
CHICAGO



## Tepeco China

Whether Lavatory, Bathtub, Water Closet, Urinal or Drinking Fountain, you will now find the entire line made by The Trenton Potteries Co. covered by the one name—"Tepeco."

It will mean a great deal to the architect who specifies plumbing fixtures to find that label on the goods he specifies.

First it means that the fixture is made entirely of clay, the glaze being fired *on* and *into* the body beneath. The resulting beauty, durability and sanitary qualities are not obtainable with any other material or process.

*Look for "Tepeco" on your plumbing fixtures. It is the trade mark of a most reliable potter.*

**The Trenton Potteries Co.**

TRENTON, N. J.

1,000,000  
"STAR"  
(Patented)

## Ventilators

are furnishing pure air for buildings of all types throughout the United States.

So perfect is their accomplishment, so simple their construction, and so thorough their durability, that the United States Government has standardized them, and adopted them on all cantonment structures.

**OUR CLAIM:** Star Ventilators give more cubic feet of air exhaust capacity per dollar invested, under like conditions of service and equal construction strength, than any other make of ventilator.

We also manufacture Evans "ALMETL" Fire Doors and Shutters Metal Tiles and Shingles (approved by the Government) and High-grade Roofing Tin

Our catalog sent gratis on request. Write for it.

**Important: MARK YOUR INQUIRY FOR DEPARTMENT 50**

**MERCHANT & EVANS CO.**  
NEW YORK PHILADELPHIA WHEELING  
BALTIMORE ATLANTA CHICAGO  
CLEVELAND ST. LOUIS  
KANSAS CITY



## Lock-Joint Plain Steel Tile

For HOSPITALS, BATHROOMS, KITCHENS, VESTIBULES, LAVATORIES, RESTAURANTS AND BARBER SHOPS

LOCK-JOINT sheets interlock without noticeable seams when applied. Cost less than earthen tile and appearance is identical. Its weight is considerably less than real tile, it can be applied by any mechanic and will last indefinitely. Fire and crack proof. Cannot work loose.

Two side edges are provided with underfold flanges and opposite side edges with "slip-in" flanges, whereby a seamless joint is effected.

Pattern 3x3 or 6x6 in. Plates 2 $\frac{1}{4}$  x 2 $\frac{1}{4}$  inches.

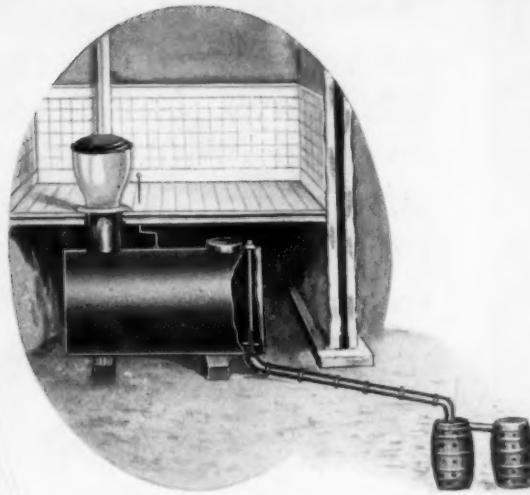
QUALITY  
**MILCOR**  
PENNS.  
MILWAUKEE CORRUGATING CO., MILWAUKEE, WIS.



**Ro-San**

# Chemical Closets

For Schools and Homes Without Sewerage



IT is predicted that within a few years every state in the Union will have passed laws compelling the abandonment of the old-fashioned type of outhouse, especially for school and church use. Several states have already passed such laws, and others are framing similar legislation.

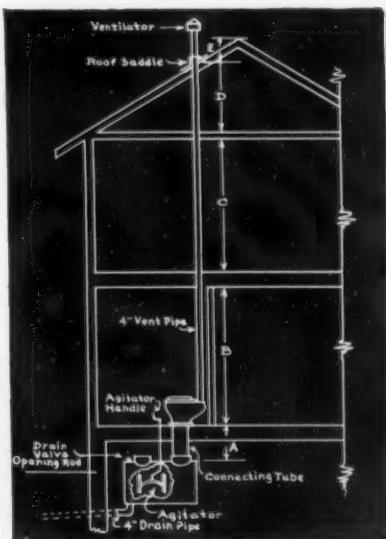
The logical and approved successor is the Ro-San Chemical Closet, which meets every requirement of convenience, comfort, sanitation, ventilation and drainage.

### ASK For Your Set of Architectural Blue Prints

For your convenience and quick reference, we have provided a set of four blue prints showing four different types of installations applicable to any kind of building.

We will also send you, on request, a complete and concise circular covering every detail of construction and use.

**The Rowe Sanitary Manufacturing Co.**  
13606 6th Street, Detroit, Mich.





## Weighs Only 110 lbs.

Here is an entirely new idea in stalls for public buildings, factories, clubs; in fact any room where space is at a premium. This stall has been well named, The Conservor, for it *does* conserve—material, labor, space and expense.

And it is more than satisfactory in every way. Its sanitary features are perfect. Every surface is in full view—no hidden corners or crevices.

The Conservor is made of genuine Monument - Quality Porcelain and requires no more space than a wall hung fixture. One man can handle it. Send for further information.

**THE MONUMENT POTTERY COMPANY**  
*Makers of All-Clay Quality Ware*

Trenton, N. J.

"CENTURIES OF SERVICE"

**PYRAMID  
NATURAL SLATE  
STRUCTURAL**

### *The "No Complaint" Stairway*

IN the first place, I slate is the longest-wearing material for stairways. It is used in such buildings as the New York Hippodrome, tramped on by thousands afternoon and evening.

Then it is highly sanitary, being non-absorbent and easily kept clean with warm water.

Third, it minimizes accidents because it does not become slippery.

Try it in your next job. More information gladly furnished on request.

**The Structural Slate Co.**  
*Manufacturing Five Carloads Daily*  
Pen Argyl, Pennsylvania

THE B.B.C.CO.  
**WHALE-BONE-ITE**  
REG. PAT. OFFICE  
CLOSET SEATS



Architects are specifying  
**Whale-Bone-Ite**

for it is—

- sanitary
- of handsome appearance
- impervious; acid-proof
- readily cleaned
- the only material that can be made aseptic without deteriorating
- of life-long durability
- equipped with concealed hinges, reducing possible corrosion.

*Specification Data:*—Water Closet Seats to be WHALE-BONE-ITE: Color —(Ebony or Mahogany), made by The Brunswick-Balke-Collender Co.

Supplied by all plumbing jobbers and closet manufacturers.

MADE BY

THE BRUNSWICK-BALKE-COLLENDER CO.  
 1623 SO. WABASH AVE., CHICAGO



Whale-Bone-Ite Seats are used in Columbia Hospital, Milwaukee, Wis., illustrated in this issue. Richard E. Schmidt, Garden & Martin, Architects

# THE IDENTIFYING MARK



¶ From prehistoric times the meritorious product has borne an identifying mark.



¶ The ancient artisan in pottery gave his work an identifying mark. It was an indication of the pride he took in his work.



¶ But more than that, it was the forerunner of the trademark as we know it.



¶ Later the painter, the printer and other artists and craftsmen followed suit, until today the trademark is considered a badge of responsibility — a guarantee of quality.

## What the Name “NATIONAL” Means to You

¶ It is your assurance of a pipe of great strength and high ductility; of uniform quality; of full weight; and, most important of all, of proved durability.

¶ It is the identifying mark of a make of tubular material manufactured in a variety of sizes and types to fulfil or anticipate all wrought tubular requirements. Remember —

*There is a “NATIONAL” Pipe for Every Wrought Tubular Service*

*Ask for “NATIONAL” Bulletin No. 25 — “NATIONAL” Pipe in Large Buildings*



**NATIONAL TUBE COMPANY, PITTSBURGH, PA.**

General Sales Offices: Frick Building

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## *Factory Sanitation*

*is a matter of vital importance.*

The Crane line of plumbing goods includes the most modern and efficient fixtures for factory sanitation, and are installed in many of the largest industrial plants throughout the country.

There is a Crane branch near you:

Boston  
Springfield  
Bridgeport  
New York  
Brooklyn  
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Camden  
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Washington  
Syracuse  
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Savannah  
Atlanta  
Knoxville  
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Muskogee  
Tulsa  
Oklahoma City  
Wichita  
St. Louis  
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Terre Haute  
Cincinnati  
Indianapolis

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Omaha  
Sioux City  
St. Paul

Minneapolis  
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Fargo  
Watertown  
Aberdeen  
Great Falls  
Spokane  
Seattle  
Tacoma

Portland  
Pocatello  
Ogden  
Salt Lake City  
Sacramento  
Oakland  
San Francisco  
Los Angeles

1855 — CRANE CO. — 1919

MURRAY ST.  
AND  
WEST BROADWAY  
NEW YORK

**CAST IRON PIPE**

installed in above building  
in 1858, provided constant sanitary  
service until 1918 subway  
construction demanded re-  
moval of the building. But  
the pipe is far from having out-  
lived its usefulness. The photo  
of a section of the leader  
line shows it is 60 years  
young and still capable  
of giving for many years  
**SANITARY and  
ECONOMICAL  
SERVICE**

60 Years Young

1918  
1858  
60

IN THE  
BUILDING  
UNDER THE  
GROUND

USE SOIL PIPE WHERE SOIL PIPE SHOULD BE USED

*Specifications and illustrated literature will be mailed upon request to any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings*

Phineas Jones & Company Co., Philadelphia, Pa.	Sanitary Company of America, Somerville Iron Works, Somerville, N. J.	Linfield, Pa.	Penn Sta., Pa.
Alphonso Gr. J. L. Cudberry Co., New York, N. Y.	Philadelphia Foundry Co., Philadelphia, Pa.	New York, N. Y.	Baltimore, Md.
Kingsley Foundry Co.	Superior Manufacturing Co.	Albion, N. Y.	Birmingham, Ala.
Madina Foundry Co.	Union Foundry Co.	Amarillo, Ala.	Charlottesville, Tenn.
Madina Iron & Brass Co.	Yerkes Foundry Co., Inc.	Asheville, Ala.	Charlottesville, Va.
National Pipe & Foundry Co., New York, N. Y.	Walter Manufacturing Co., Inc.	Hopkinsville, Ky.	Charlotte, N. C.
National Pipe & Foundry Co., Reading, Pa.	Abendroth Brothers	Port Chester, N. Y.	Birmingham, Ala.
Reading Foundry and Supply Co.	Agnew Pipe Co.	Gadsden, Ala.	Jackson, Miss.
Salem Brass & Iron Manufacturing Co.	Alabama Pipe & Foundry Co.	Kinston, N.C.	Gadsden, Ala.

Partial List of Contents

138 photographic illustrations

11 pages of details

10 complete specifications

Numerous tables

Size of book, 8½ x 11 inches, 64 pages

Arched floors  
Ceilings  
Conduits  
Fences  
Finishes for stucco  
Floors  
Furring  
Garages  
Overcoating  
Partitions  
Roofs  
Safe loads on slabs  
Stucco residences  
Tanks  
Walls and sidings

**METAL LATH**  
Because Metal Lasts

# FREE-A-New Book for Those who Plan and Build.

"Magnificent" — "invaluable" — "most useful" — "finest of trade literature" — are a few of the comments on the new Hy-Rib and Metal Lath Book just off the press.

Ordinarily our printed literature is not featured in our advertisements, which we prefer to devote to the merits of our product and service. But this new book is so exceptional in every way that we would be neglecting a duty to our friends if we did not bring it prominently to their attention.

Practically everything on the application and use of Hy-Rib and Metal Lath products is included. Hundreds of photographic illustrations — page after page of large-scale details — complete specifications on many subjects — tables for designing — in short, just the book needed by the architect, engineer, contractor, plasterer or owner. A book of large size, 64 pages in all, convenient to use and attractively printed and bound.

The new Hy-Rib Book will be sent free to responsible persons, on return of attached coupon or request on letterhead. If you care to give us information about contemplated building, we would appreciate it, but at any rate write for book. Address Hy-Rib and Metal Lath Department.

**TRUSCON STEEL COMPANY**  
**YOUNGSTOWN-OHIO**  
WAREHOUSES AND SALES OFFICES IN PRINCIPAL CITIES

# HY-RIB

Truscon Steel Co., Youngstown, O.  
Send free copy of new Hy-Rib Book. I am interested in building a

Name \_\_\_\_\_

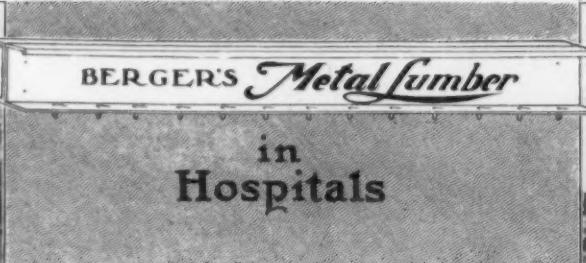
Position \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ A.F.



St. John's Hospital, Salina, Kansas  
Architect, C. A. Smith, Salina, Kansas



General City Hospital  
Kansas City, Missouri



Attix Hospital, Lewiston, Montana  
Architects, Wasmansdorff & Eastman



State Hospital, Marshall, Missouri  
Architects, J. H. Felt & Co.

**S**UBSTANTIAL strength, light weight and unsurpassed fire resistance make Berger's Metal Lumber the ideal material for Hospital construction.

Metal Lumber joists and studs have been used in Hospitals as well as in Schools, Hotels, Apartments and many other types of buildings in all parts of United States and in foreign countries.

*See Sweet's, and ask nearest Berger Branch for our Technical Bulletin L-8*

## THE Berger Manufacturing Co.

CANTON, OHIO

BRANCHES

Boston	New York	Philadelphia
Chicago	St. Louis	Minneapolis
		San Francisco

EXPORT DEPARTMENT

516-524 West 25th Street  
New York City  
U. S. A.



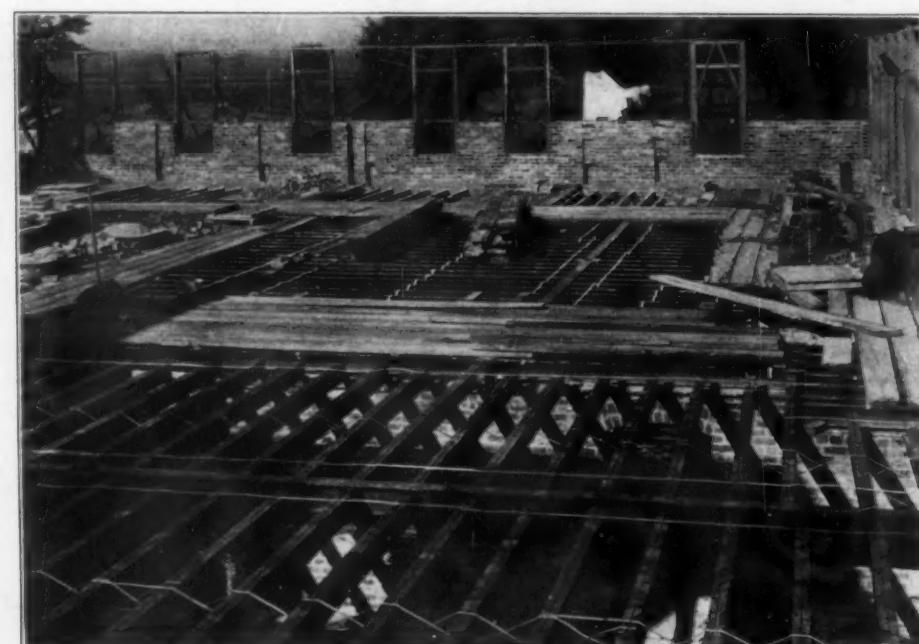
Mercy Hospital, Canton, Ohio  
Architect, W. P. Ginther



Cottage-State Hospital for the Insane  
Toledo, Ohio  
Architect, G. Enright



Crouse-Irving Hospital, Syracuse, N. Y.  
Architect, Earl Hallenbeck



Construction View of State Hospital for the Insane, Toledo, Ohio



St. Vincent's Hospital, Birmingham, Ala.  
Architect, Harry Wheelock





## How Back Plastering Can Be Satisfactorily Omitted

**K**N housing projects and other construction wherein cost must be kept down, back plastering can be omitted without detracting from the strength of the structure, by using KNO-BURN Corrugated Metal Lath. The method of procedure is simple:

The wood studs are erected just as if the usual wood exterior or sheathing and siding were to be used. A heavy waterproofed building paper is then fastened on the outside of the studs to prevent the wet stucco from coming into contact with the wood and also to act as backing for the lath. Over this is applied KNO-BURN Corrugated, a *Se'-Furring* Expanded Metal Lath.

THE stucco is then put on in three coats on the exterior of the lath *only*. The wet plaster forces itself through the corrugated mesh, completely embedding it and forming an almost smooth surface on the back. The need for back plastering is thus eliminated. A definite saving of plastering materials results.

THE fibres of the tarred paper work themselves into the plastic body. The paper thus prevents the wood studs from absorbing moisture and is an added insulation against temperature changes. The metal lath is thoroughly protected, since there is no chance for moisture reaching the interior of the wall. The interior walls are then finished in the usual way.

The durability, economy and ultimate satisfaction of this form of construction have been repeatedly demonstrated to the satisfaction of architects, owner, engineers and contractor.

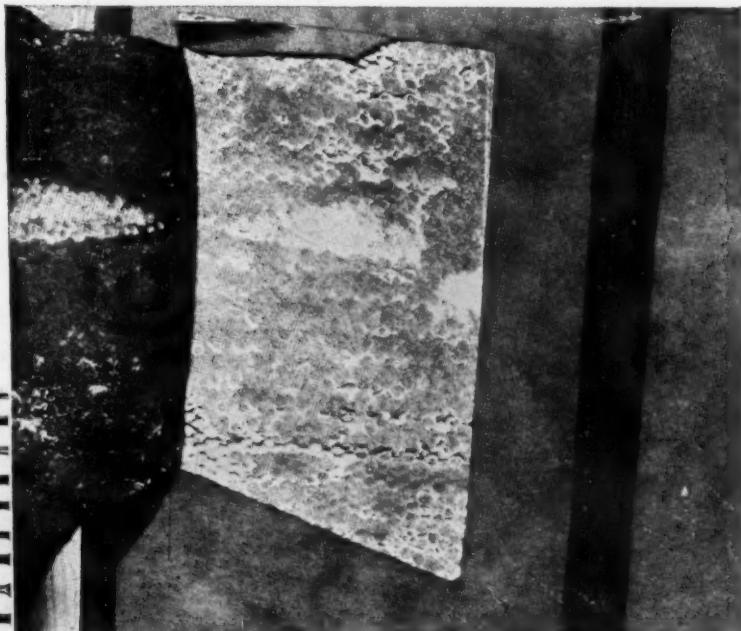
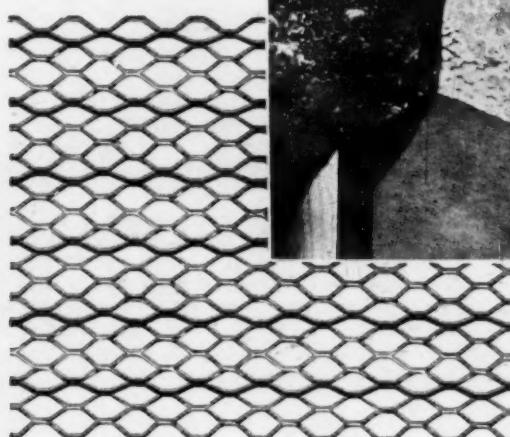
Write us for Recommended Specifications.  
Also for free KNO-BURN Catalog and Samples.

### Kno-Burn Corrugated METAL LATH

## NORTH WESTERN EXPANDED METAL COMPANY

934 Old Colony Building

CHICAGO



NOTE THE  $\frac{1}{4}$  INCH  
CORRUGATIONS WHICH  
FUR THE LATH OUT  
FROM THE PAPER

The above cut shows a section of the tarred paper backing cut away. Observe how perfectly the metal lath is embedded



*The Store Fronts will Determine the Effect of this Modern Building*

**Kawneer**  
Store Front Construction

will show up this building — or any other — at its best. Since Kawneer Fronts were invented some twelve years ago, over 75,000 have been installed. This proves their worth from an architectural and sales-pulling standpoint.

You can easily realize that the profitable installation of Kawneer Store Fronts is not confined to new buildings. The more antiquated the structure, the more receptive the owner is to the idea of modernizing it by the Kawneer method.

We help you in every way possible to make the job satisfactory. Service has been a big reason for Kawneer progress.

Catalog K should be in every Architect's files. Write for it.

**KAWNEER MFG. COMPANY,**  
1420 Front Street NILES, MICHIGAN

This shows a patented Kawneer feature. The corner bar—copper or bronze—holds the plate glass with a rugged but resilient grip, that defies all winds.

# Herringbone Rigid Metal Lath

*U. S. Shipping Board  
Housing Project No. 11  
Dundalk, Maryland  
Consolidated Eng. Co. Contrs.*

## Herringbone Rigid Metal Lath

was used in the great industrial housing projects of the U. S. Shipping Board at Dundalk and St. Helena, Md.

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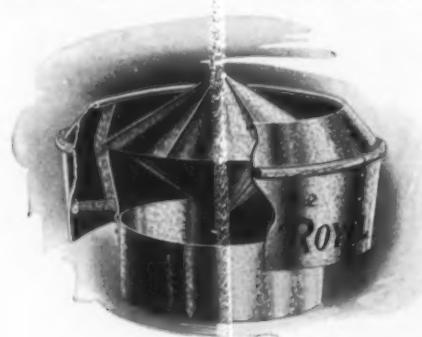
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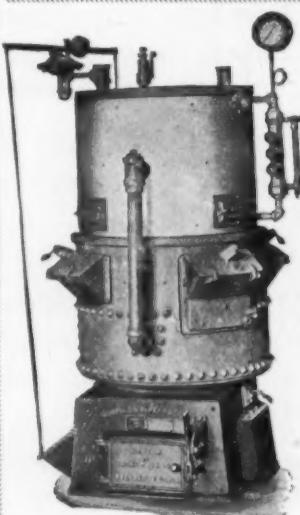
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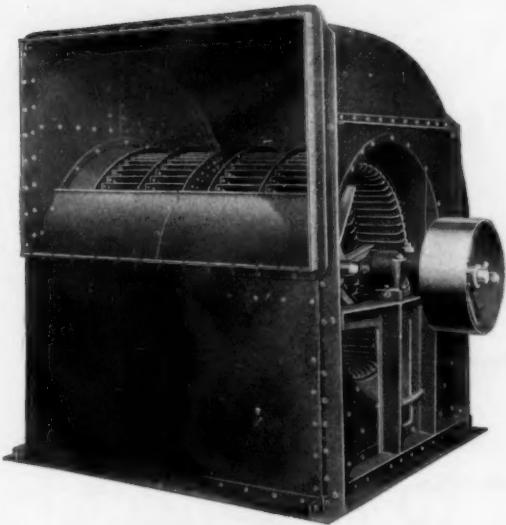
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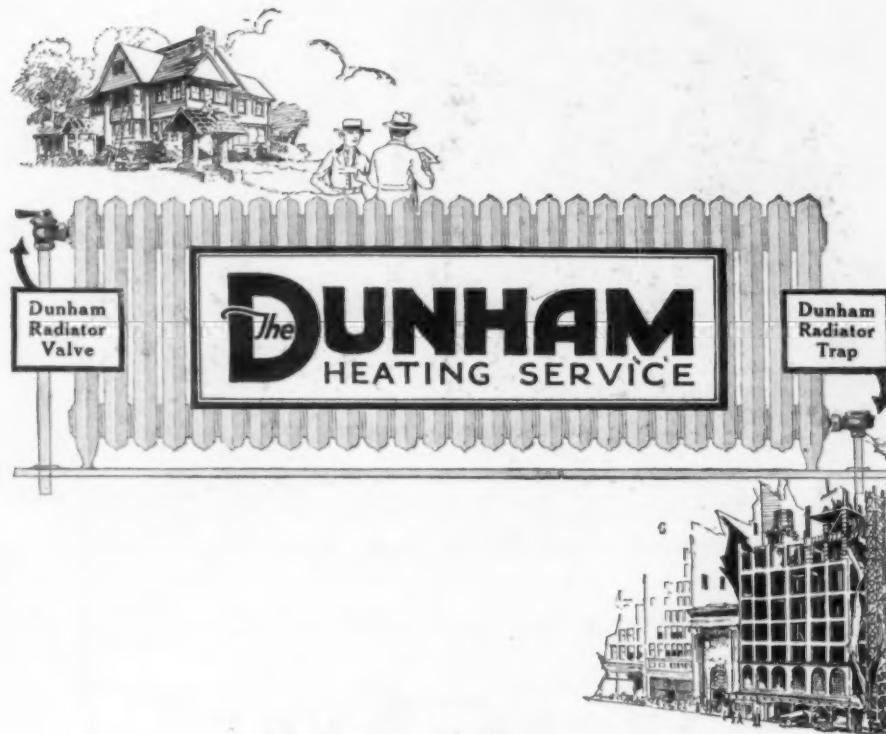
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Many of them highly informative. Most of them so dry it makes you sneeze to turn the pages. Strange, too, when you come to think of it; for surely any writer ought to find no difficulty in warming up to such a subject.

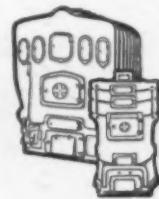
Take boilers, for instance; it's not just a happen-so, that some are made the way they are made; but it is very wearisome, all that lingo about "direct surfaces," "combustion chamber thermats," and the like.

One day, one of us heard a plain, little old country hardware dealer explain in a clear,

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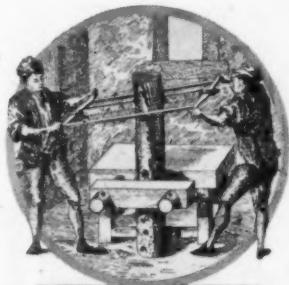
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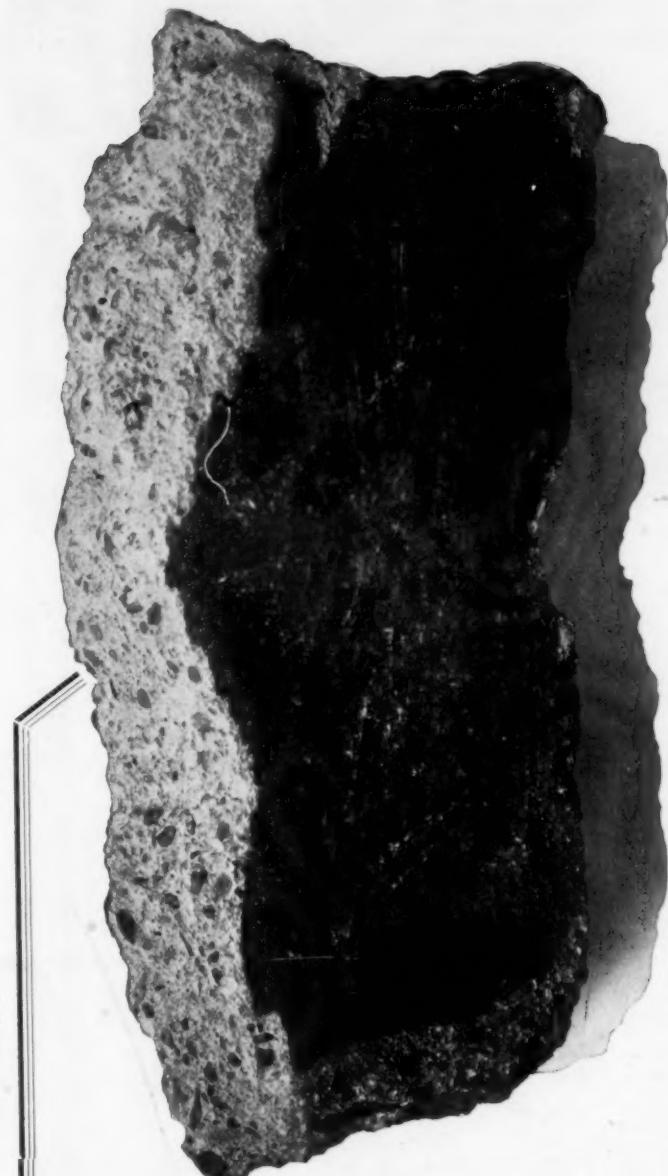
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*Director Diffuselite Department*

*Address all communications to*

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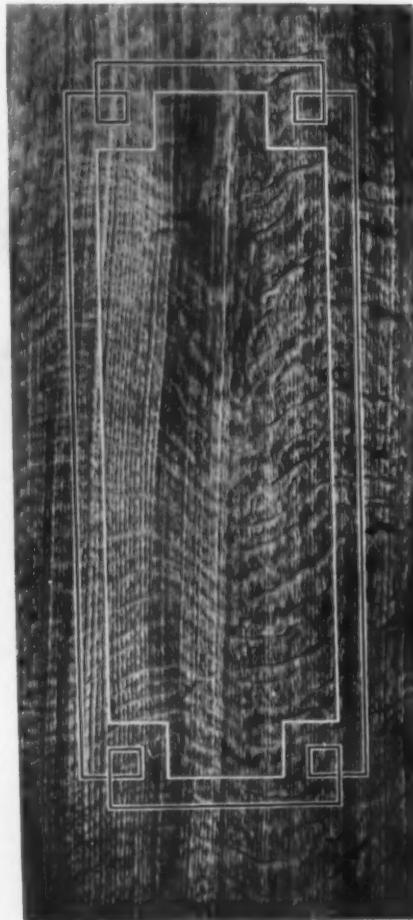
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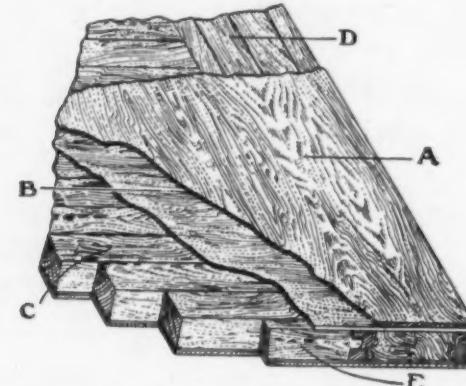
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Morgan Flush Sanitary Doors are carried in stock in a variety of styles and finishes. Special designs and sizes built to order promptly, in strict accord with specifications.



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